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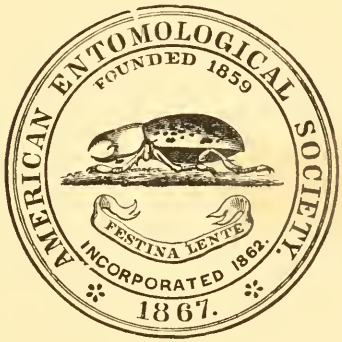

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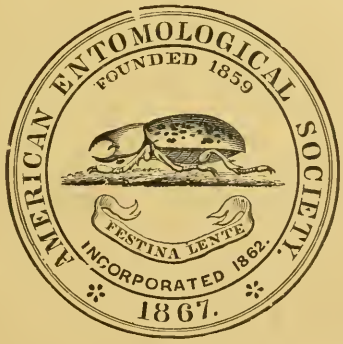

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VOLUME XXXVI.

Revision of the BLASTOBASIDÆ of North America.

BY WM. G. DIETZ, M. D.

(PLATES I–IV.)

The Blastobasidæ as now understood and distinguished from the Œcophoridæ form a well defined family of the Tineina. Although the term had been used by Mr. E. Meyrick* as far back as 1894, and since that time by Lord Walsingham,† the honor of giving the first definition of the family under consideration belongs to Mr. A. Busck.‡

Its characters are as follows:

Labial palpi variable in development, often dimorphic in the sexes.

Maxillary palpi rudimentary.

Antennæ shorter than the forewings; excised above the basal joint in some (Pl. II, figs. 14, 17*a*) (*Blastobasis*, *Valentinia*, *Holocera* in part, *Euresia*), the excision being more or less filled by a scale tuft arising from the proximal end of the excision. The basal joint more or less widened into an eye cap, convex above, concave beneath with a glabrous space which covers the eye in repose; anterior margin of joint fringed with long, more or less stiff hairs—pecten (Pl. II, fig. 7*b*), or else with a conchiloidal shield of close set, long scales (Pl. I, fig. 7*a*) (*Calosima*, *Zenodochium*).

* Trans. Ent Soc., London, 1894, p. 22.

† Proc. U. S. Nat. Mus., Vol. XXXIII, p. 199, also Ent. Mo. Mag., Vol. XLV, p. 46.

‡ Proc. U. S. Nat. Mus., Vol. XXXV, p. 187.

Face smooth scaled, vertex often with coarsely appressed scales.

Forewings elongated, pointed, with twelve veins; cell long, veins 2 to 10 crowded at its end (Pl. I, figs. 1, 8; Pl. II, figs. 13*a*, 17*c*), the latter sometimes a little removed from the angle, veins 7 + 8 stemmed, 7 to costa before the apex, rarely to latter; 4 + 5 stemmed in Pigritiæ (except *Dryoperia*), free in Blastobases. Basal membrane thickened between the distal end of vein 11 and the costal margin—the *stigma* of Zeller. Vein 1*b* furcate at base.

Hindwings lanceolate to ovate, the costal margin generally retuse from or somewhat before the insertion of vein 8; 7 or 8 veins.

Posterior tibiæ roughened above with long, coarse hair.

The pattern of markings of the forewings consists in general of a patch on both margins at about one-third the wing length, frequently coalescing and forming a fascia, more or less distinct, a spot in the median space before the middle—first discal—and two spots at end of cell, second discals; more rarely there is a spot on the posterior margin of the cell beyond the middle of wing length; very rarely (*Calosima*) the wing is devoid of all markings.

The primary stages of a large number of these insects remain thus far unknown, especially is this the case of the subfamily Pigritiæ, of which we are entirely in the dark. The larvæ of some Blastobases are known to live in seed vessels, while others are predaceous upon Caocids, Aphids, and possibly other larvæ.

In his generic table of genera, published in 1907,* Lord Walsingham enumerates eighteen genera, six of which are foreign to our fauna. Of the remaining twelve, *Endrosis* has properly been referred to the Œcophoridæ. Of the other eleven, four (*Epigritia*, *Catacrypris*, *Cynotes*, *Hypatopa*, syn. *Hypatima*), being based on secondary sexual characters or the relation of vein 5 to 3 + 4 of hindwing, become invalid. Thus in his latest revision, published in February of the present year,* we only find enumerated ten genera. Two

* *Op. cit.*

of these—*Tecmerium*, *Auximobasis*—do not occur in our fauna.

Hypatima Hb., was founded on *Chelaria conscriptella* Hb., a Gelechid.

Hypatopa Wlsh., type *Œcophora inunctella* Zell., and *Cynotes* Wlsh., type *iceryœella* Riley, were established on vein 5 of hindwing, being feer from stem of 3 + 4. This character is very variable, not only in different specimens of the same species, but even in the wings of the same individual.

Epigritia Dietz, type *pallidotinctella* Dietz (*ochrocomella* Clem.), and *Catacrypsis* Wlsh., type *uncella* Wlsh., differ from *Pigritia* Clem., and *Holcocera* Clem., respectively, only in secondary sexual characters. *Calinita* Busck., type *sponsella* Busck., is a synonym of *Arotrura* Wlsh.—*Scythris* Hb.

Dryope, according to Mr. Karl R. Coolidge,* preoccupied in Diptera and Crustacea, he proposes *Dryoperia* in its stead.

To these eight genera I have to add three new ones, making a total of eleven. They fall into two well defined and easily recognizable groups or subfamilies, as follows:

Labial palpi very small, often minute.....**Pigritiæ.**
Labial palpi well developed, long, generally recurved...**Blastobases.**

Subfamily PIGRITIÆ.

Characterized as follows: Labial palpi short, moderate in both sexes (*Ploiophora*); very minute in the male, longer and more distinct in the female (*Pigritia*, *Pseudopigritia*), or else very minute in both sexes (*Dryoperia*). Antennæ not excised above the basal joint. Forewings with veins 4 + 5 stemmed, rarely (*Dryoperia*) separate. Hindwings with seven veins.

The four genera belonging here are distinguished as follows:

1. Veins 4 + 5 of forewing stemmed.....2.
   Veins 4 + 5 of forewing free.....4. **Dryoperia.**
2. Vein 9 of forewing free.....3.
   Vein 9 of forewing and of vein 7.....3. **Pseudopigritia.**
3. Third joint of labial palpi depressed.....1. **Ploiophora.**
   Third joint of labial palpi not depressed.....2. **Pigritia.**

* Ent. News, Vol. XX, p. 112.

For further consideration of the genera and species of this subfamily I refer the student to my paper entitled "On *Pigritia* Clem.,"* but I wish to make here a correction. An examination of the type of *Pigritia ochrocomella* in the collection of the American Entomological Society at the Academy of Natural Sciences of Philadelphia, subsequent to the publication of my paper, proved this to be identical with my *pallidotinctella*, type of *Epigritia* Dietz, also that *heidemannella* is only a variety of *ochrocomella*. What had been recognized and described by me as *ochrocomella*—determined as such by Lord Walsingham—will hereafter be known as *erratella*. Of the twenty-nine species enumerated in Dr. Dyar's list, one will be reduced to a variety.

Subfamily BLASTOBASES.

Labial palpi always strongly developed, long, and generally recurved. Veins 4 + 5 of forewing free. Hindwings with eight, more rarely (*Blastobasis*, *Zenodochium*) with seven veins.

Dr. Dyar's list contains twenty-two species of this subfamily. Of these, *Blastobasis subtractella* Walker is a Gelechid; *Holcocera quisquiliella* Zell. I regard as a variety of *chalcofrontella* Clem.; *Hol. nubiliella* Zell. is identical with *Gelechia glandulella* Riley (type of *Valentinia* Wlsh.); *Holc. triangularisella* Ch. is *Hol. sciaphilella* Zell.; *Hol. fuscopulvella* Ch., no description known, leaving thus seventeen species and one variety; Lord Walsingham† in his paper described fourteen new species. Four of these, however (*Hypatopa episcia*, *conia*, *fasciata* and *orites*), belong to the Œcophoridæ, and have been referred by Mr. A. Busck‡ to the genus *Borkeuhausia* Hüb. To the remaining ten have to be added two of Chambers' species brought to our notice by his lordship and omitted by Dr. Dyar in his list. This then brings the number of species heretofore described to twenty-nine and one variety. To these I have to add thirty-

* Trans. Am. Ent. Soc. XXVII, p. 100 *et seq.*

† *Op. cit.*, 1907.

‡ Proc. U. S. Nat. Mus., Vol. XXXV, p. 204.

seven species and ten varieties, making a total of sixty-six species and eleven varieties distributed among seven genera.

The latter are distinguished as follows:

1. Hindwings with seven veins.....2.
   Hindwings with eight veins.....3.
2. Basal joint of antennæ with pecten.....1. **Blastobasis.**
   Basal joint of antennæ with conchiloidal shield..2. **Zenodochium.**
3. Veins 3 + 4 of hindwing free.....4.
   Veins 3 + 4 of hindwing stemmed.....3. **Valentinia.**
4. Vein 4 of hindwing from before angle of cell.....4. **Euresia.**
   Veins 3 + 4 of hindwing from angle of cell.....5.
5. Basal joint of antennæ with pecten.....6.
   Basal joint of antennæ with conchiloidal shield.....5. **Calosima.**
6. Forewings without ridge of raised scales.....6. **Holcocera.**
   Forewings with such a ridge.....7. **Eubolepia.**

BLASTOBASIS Zell.

Type *phycidella* Zell.

Tongue of moderate length, scaly at base. Labial palpi long, recurved, generally a little shorter and stouter in the male than in the female. Basal joint of antennæ broad, convex, with well-marked pecten; shaft excised above the base in the male with scale tuft in the excision; shortly ciliate and finely denticulate beneath. Forewings more or less elongate, pointed; twelve veins, 7 + 8 stemmed, 7 to costa, remaining veins free. Hindwings with seven veins, 4 absent, 3 + 5 connate or stemmed. Hind tibiæ with brush of setaceous hairs above.

The only character which distinguishes this genus from the other genera with long labial palpi are the hindwings with seven veins only, agreeing in this with *Zenodochium* and from which it differs by the pecten of the basal joint of the antennæ.

Blastobasis citricolella Ch. and *coccivorella* Ch. belong to *Zenodochium* Wlsh., *Blastobasis umbiliella* Zell., *glandulella* Riley, is a *Valentinia*. *Blastobasis subtractella* Walker, is a Gelechid; *Blastobasis sciaphilella* Zell., *fractilinea* Zell., *quisquiliella* Zell., *livorella* Zell., and *fluxella* (?) Zell., belong to *Holcocera*; *Blastobasis aufugella* Zell., to *Pigritia* Clem.

The seven species and two varieties may be distinguished as follows:

1. Forewings without fascia....2.
   Forewings with fascia more or less distinct....5.
2. Unicolorous, pale yellowish-brown....7. **vilella.**
   Not yellowish-brown....3.
3. Pale grayish-fuscous....4. var. **simpliciella.**
   Dark fuscous-brown....4.
4. Basal two-fifths a shade paler....4. var. **fuscopurpurella.**
   Basal two-fifths not paler....1. **guilandinæ.**
5. Fascia straight or slightly curved....6.
   Fascia angulated....7.
6. With median costal patch....2. **hulstella.**
   Without such a patch....6. **distinctella.**
7. Ochreous-fuscous, angle of fascia not very acute..3. **yuccæcolella.**
   Grayish-fuscous, angle very acute....8.
8. Discal spot within the fascia....5. **sagitella.**
   Discal spot beyond the fascia....4. **plummerella.**

1. **B. guilandinæ** Busck.

Mr. Busck describes this species as follows:

"Antennæ dark fuscous, basal joint yellowish; in the male strongly notched beyond first joint, with pecten on this joint; shortly ciliated in its entire length; in female simple, basal joint with pecten. Labial palpi smooth, curved, slender, dark fuscous; tip somewhat lighter. Tongue stout, scaled at base, coiled at the end. Head and thorax yellowish fuscous; forewings dark fuscous with a somewhat lighter shade before apex and along costa. A small deep black spot on middle of cell, two similar black spots at end of cell, one above the other; below these an indistinct blackish spot and similar indistinct blackish spots along the apical edge. Cilia yellowish fuscous. Hindwings shining, yellowish fuscous. Abdomen shining, dark fuscous; anal tuft yellow; underside whitish, speckled with dark fuscous. Legs yellowish with fuscous shadings on the outside; hairs above posterior tibiæ ashy yellow." Alar expanse 14 mm.

Bred from *Guilandina handucella*, collected by Dr. Dyar at Palm Beach, Florida, March 5, 1900.

I have seen the type specimens in the Nat. Mus. Coll. There is some resemblance to *Holcocera chalcofrontella*, var. *fumerella*, from which it is sufficiently removed by the venation of the hindwings. The third joint of the labial palpi is very slender and nearly as long as the second.

2. **B. hulstella** n. sp. (Plate I, fig. 2).—Palpi long, ascending, slightly recurved, moderately thick, the terminal joint nearly the thickness of the preceding one, gray, the second joint without densely, the third less so, overlaid with fuscous, extreme apex of former pale. Head gray, speckled with fuscous. Antennæ dark fuscous brown, a trifle paler beneath, basal joint sordid grayish-white, scarcely one-half longer than wide, pecten of stiff hairs. Thorax gray, speckled with fuscous, more densely anteriorly, forewings moderately wide, ground color rather densely overlaid with dark fuscous-brown so as almost to conceal the former, but leaving a distinct whitish fascia at one-third, the latter is nearly straight, equidistant from the base at both margins, and slightly bisinuate externally, it is heavily shaded externally, especially in dorsal portion, forming a large, triangular dorsal patch not sharply defined externally; at the end of the cell are two large, dark brown spots; the dark dusting is somewhat more condensed along the costal margin; cilia dark gray, sprinkled with whitish and fuscous scales. Hindwings as wide as the forewings, costa not retuse, apex obtuse; gray, dusted with fuscous, especially along the margins. Abdomen above brown, segments fringed with pale scales; underside of body and legs grayish-white, dusted with brown, apices of tarsal joints paler.

Expanse 15.0 mm., 0.6 inch.

Hab.—Texas, exact locality not known. A female specimen in my collection, contained in the Hulst Collection, and obtained from Prof. John B. Smith of Rutgers College. It gives me pleasure to name this form after its illustrious collector, the late Rev. George Hulst.

3. **B. yuccæcolella** n. sp. (Plate I, fig. 3.)—Head dark ochreous; obscurely flecked with some fuscous scales; antennæ rather robust in the male, more slender in the female, fuscous brown, basal joint ochreous. Palpi not slender, alike in both sexes, grayish-ocherous, thickly dusted with dark brown scales, apex of the second and third joint pale. Thorax ochreous-fuscous. Forewings elongate, pointed, ground color grayish-ochreous, overlaid with bark-brown scales, the latter intermixed especially in outer part of wing with pale scales, basal space paler than remainder of wing, limited externally by an irregularly curved line, a large subquadrate costal and a smaller dorsal patch, a heavy dash in the fold, base dusted with fuscous, some scatterd dark scales along the fold, the marginal spots are about equidistant from the base, remainder of wing more densely overlaid with fuscous scales, especially along the costa, with a nebulous spot about the middle, apical part of wing interspersed with whitish scales, which give when examined with a fairly strong lense a "pepper-and-salt" appearance; two spots at end of cell, the lower one generally larger

and more distinct, below the latter on the dorsal margin is an indistinct spot; these spots are variable and may be obsolete. Cilia gray, with some whitish scattered scales in basal portion. Hindwings rather narrow, pointed, under 1, grayish with some lustre; cilia gray, nearly 2. Abdomen fuscous, segments fringed with whitish scales; anal bush ochreous-fuscous. Legs grayish, fuscous externally, an oblique band at middle externally and apices of tibiæ pale; tarsi fuscous, joints pale at apex.

Expanse 12.0–18.0 mm., 0.41–0.72 inch.

Hab.—Texas.

Five specimens, three females and two males, in the Nat. Mus. Coll. are before me. They bear the label "Bred from *Yucca baccata*, iss. Apr. 18th, 1897." It is quite likely that freshly bred material may have a decided darker color.

4. **B. plummerella** n. sp. (Plate I, fig. 4.)—Head, palpi, basal joint of antennæ and thorax gray, dusted with fuscous, with some metallic lustre; antennæ fuscous, very faintly annulate with pale; stouter, finely denticulate and ciliate beneath, cilia ½, deeply excised above basal joint in the male, simple and more slender in the female, palpi slender, a trifle longer in the female than the male, second joint dark fuscous externally and along the margins within, third joint nearly as long as the second, thinly dusted with fuscous. Forewings elongate, ground color grayish-white, clouded with dark fuscous; base dark fuscous becoming paler externally where it leaves an ill-defined, strongly curved fascia, the summit of which reaches to two-fifths and within the latter is the first discal spot, externally the fascia is limited by dark fuscous marginal clouds beginning at one-third, which more or less coalesce and become effaced externally, the fuscous clouding is more pronounced in costal half of wing, two well-marked spots at end cell, another ill-defined, but strongly curved fascia in apical part of wing; the fuscous dusting is interspersed with whitish scales; cilia grayish-fuscous, sparsely sprinkled with whitish scales. Hindwings nearly 1, grayish-fuscous, darker externally and along the dorsal margin; cilia gray, a little over 1, paler towards the base. Abdomen fuscous, anal bush ocherous; legs grayish-white, more or less thickly—especially externally—dusted with fuscous, tip of tibiæ and tarsal joints paler. Expense 10.0–14.0 mm., 0.4–0.56 inch.

Hab.—Plummer's Island, Md.

Six specimens, three males and three females, from the Nat. Mus. Coll. are before me. Taken by Mr. A. Busck at the above locality, July, 1903. Somewhat variable in extent and definition of markings and even in wing form.

Var. **fusco-purpurella.**

Two specimens taken with the above are decidely dark fuscous brown, sprinkled with whitish scales, the latter more profuse in basal two-fifths, this space is acutely angulated outwardly, the apex of the angle extending beyond the middle of wing length. The wings are somewhat broader than in the typical form, and it may prove to be distinct.

Var. **simplicella.**

A female specimen in my collection from Iowa City, expansion 16.0 mm., 0.64 inch, differs from the above by the second palpal joint being pale at apex, head and basal joint of antennæ ochreous-gray, thorax grayish-fuscous. Forewings gray, without markings, except a dark fuscous patch at base of costa and two large spots at end of cell. It will probably prove distinct.

5. **B. sagitella** n. sp. (Plate I, fig. 5.)—Head gray, finely speckled with fuscous, without lustre; antennæ slender, fuscous, very indistinctly annulate with pale, finely denticulate beneath, basal joint gray. Palpi moderate (♂) gray, thinly dusted with fuscous, lower margin and a narrow ring before the extreme apex of second joint dark fuscous, extreme apex pale, third joint conical, two-thirds the length of second. Forewings moderately wide, gray, speckled with dark brown; a pale fascia at one-third, a little nearer the base on the costal margin and acutely projecting into the median space above the fold, outwardly the fascia is heavily margined with dark fuscous brown, basal portions of wing rather densely covered with dark fuscous scales at the base and along both margins, a fine dark line immediately below the fold; outer part of wing more densely fuscous in costal portion; two well marked spots at end of cell; about six or seven well marked marginal spots around the apex, those on the costa more distinct. Cilia gray, dusted with fuscous scales, especially in basal portion. Hindwings a trifle under 1, grayish-fuscous, rather obtusely pointed, cilia grayish-fuscous, especially towards the apex, with pale basal line. Thorax and abdomen dark fuscous, anal bush ochreous-gray. Legs grayish-fuscous, tarsi darker. Expanse 11.0 mm., 0.44 inch.

Hab.—Hazleton, Pa.

A single male specimen, taken at light, August, 1908. Well marked and unlike any other species of the genus.

6. **B. distinctella** n. sp. (Plate I, fig. 6.)—Head grayish-white, with some lustre, antennæ slender, grayish-fuscous, indistinctly annulate with paler, basal joint grayish white. Labial palpi long, slender, the third joint three-fourths the length of the second, whitish, rather densely dusted with fuscous scales without, less so within, extreme apex of second joint and basal portion of third whitish. Thorax grayish-fuscous. Forewings elongate, pointed, ground color white, outer three-fifths rather densely dusted with fuscous, especially so adjoining the whitish basal portion, the latter speckled with fuscous towards the base, thus leaving a nearly white fascia at two-fifths, approximately straight, somewhat irregular without and ill-defined within; a rather large, ill-defined spot at the middle at one-half the wing length, and two crescent shaped coalescent spots at end of cell, the upper one reaches a trifle further outwardly, their concavity towards the base; beyond these is a rather large, irregular spot. Cilia grayish with some scattered brownish scales. Hindwings 1, gray, dusted with fuscous, especially towards the apex, cilia 1, gray with pale basal line. Abdomen fuscous, segments fringed posteriorly with pale scales. Legs grayish-fuscous, tibia at apex, an ill-defined spot at middle externally, and apices of tarsal joints paler. Expanse 17.0 mm., 0.68 inch.

A female specimen without locality label in the Nat. Mus. Coll., numbered 21,469. It bears some remote resemblance to the European *B. phycidella*, but the insect is lighter in color, more strongly marked, wings, especially the hind wings, wider and less pointed.

7. **B. villella** Busck.—"Labial palpi light yellowish-brown, blackish on the outside, Face, head, thorax and anterior wings unicolorous light yellowish brown, the same shade as in pergandella (Triclonella), without markings of any kind. Posterior wings shining yellowish fuscous, cilia golden brown. Legs yellowish brown, tarsi on the outside blackish. Alar expanse 15 mm."

The type, a female specimen in the National Mus. Coll., was bred by Mr. Pergande from *Xalisma* (*Andromeda*) *ligustrina*, collected at Cabin John, Md. Mr. Busck referred this species to his genus *Triclonella*. In a personal conversation, however, he informs me that it belongs to *Blastobasis*. The venation of the hindwings is that of the genus under consideration, but as to the forewings I could not satisfy myself. It certainly is an aberrant form.

ZENODOCHIUM Wlsh..

Type.—Monopetali Wlsh.

Agrees with *Blastobasis* in venation, and from which it differs by the conchyloidal shield of close set scales, replacing the pecten of the basal joint of the antennæ. Lord Walsingham describes the palpi "middle joint densely clothed." While this cannot be said of the two species which I refer here, I consider the character too vague to be of generic value.

1. **Z. citricolella** Ch. (Plate I, figs. 7, 7*a*.)—Head white, thinly speckled with pale fawn-colored scales; face smooth, vertex somewhat rough-scaled, Antennæ white, tinged with gray, finely denticulate beneath, basal joint with a few scattered fawn-colored scales; pecten replaced by a flattened, curved tuft of white scales. Labial palpi long, not very slender, white, thickly sprinkled, especially externally, with brownish scales, third joint nearly as broad at base than the apex of the second joint and about two-thirds the length of the latter (♂). Forewings moderately wide; white, suffused with dark fuscous and densely sprinkled with brown and fawn-colored scales; markings dark fuscous, in longitudinal lines or patches, somewhat as follows: A subcostal streak for about two-fifths from the base, a line above the fold of equal extent, a heavy, irregular streak in the fold from near the base to about the middle where it almost joins a dark irregular spot in the fold; a short line near the base and within the dorsal margin; above the plical spot and about the middle of the wing is another less distinct spot, and above this a dark line parallel to the costa and ending above the two well marked spots at end of cell, two short dashes in dorsal half of wing, the outer one ending immediately below the lower spot at end of cell, several short dashes in apical part of wing, between these latter are a number of short, white, longitudinal lines. Cilia whitish, sprinkled with pale brown scales, forming irregular lines. Hindwings a trifle under one, pale yellowish-gray, shining, thinly sprinkled with fuscous externally; cilia scarcely over 1, yellowish-gray, paler at base. Thorax whitish, thickly overlaid with brown, patagia more thinly sprinkled. Abdomen silvery gray above, anal bush concolorous, underside white. Legs white, slightly dusted with brown; hind tibia very coarsely rough haired. Expanse 12.0–19.0 mm., 0.48–0.76 inch.

Hab.—Florida, Texas. Bred from dry orange infected with *Aræocerus fascieulatus*.

Type in Nat. Mus. Coll. A ♂ specimen from the same source is before me, it bears label "1101 P. Tinea from

granate apple, April 21, 1879." Another specimen in my collection, also a male, from Brownsville, Texas, is much smaller and less distinctly marked.

Lord Walsingham's statement concerning the palpi "terminal joint more than two-thirds the length of the median," refers to the female.

What Chambers meant by his statement, "the fact that the submedian vein of the forewing gives off a branch to the dorsal margin from about the middle which I have not observed in any other Tineid" is difficult to explain, as neither Mr. Busck nor myself have been able to discover such a vein.

Z. coccivorella Ch.

I give here Mr. Chambers' short description: "As mentioned in the description of *citricolella*, this species, of which I have seen two damaged females, has a tuft projecting from the basal joint of the antennæ. Face elongate and narrow, more convex than in citricolella. It is smaller and not so slender. Submedian vein of forewing not branched. It is sordid whitish with silken lustre, dusted with fuscous, a fuscous streak on forewing at base of fold, one near the base within the costal margin, apical part of wing densely dusted with fuscous. Hindwings stramineous."

"Comstock informs me that the larva lives on a large *coccus* on oak."

Lord Walsingham* makes the following note on this species: *Type*.—A female. *Habitat*.—Cedar Keys, Florida. Larva in coccid-scales on oak (*Kermes*, species, near *pallidus* Reaumur). Collected in March; issued between April 1–10. This species is omitted from Dyar's list. If the type is still extant, there should be no difficulty in placing it in its proper genus. Chambers' reference to the neuration is doubtless incorrect."

I have no comments to make. The type is not in the Nat. Mus. Coll. Notwithstanding the difference in their larval habits I have a suspicion that *coccivorella* is only a varietal form of, if not identical with, *citricolella*. As I have not seen the former, this is merely conjectural.

* Proc. Nat. Mus., Vol. XXXIII, p. 204.

VALENTINIA Wlsh.

Type *glandulella* Riley.

Labial palpi long, recurved, slender; generally more robust with the terminal joint relatively shorter in the male than in the female. Antennæ shorter than the forewings, basal joint broad, convex, with distinct pecten, deeply excised above the latter with a scale tuft in the excision in the male; shaft stouter in the male than female. Forewings elongate, pointed, costa approximately straight, depressed to apex in apical part. Twelve veins, 7 and 8 stemmed, 7 to costa, remaining veins free. Hindwings variable; nearly as wide as the forewings, with dorsal margin more or less distinctly curved, cilia scarcely over $1\frac{1}{2}$, or scarcely half as wide as the forewing, dorsal margin nearly straight from near the base to the acutely pointed apex and cilia 2 or over. Eight veins, 6 and 7 separate, 4 and 5 stemmed, 3 free, arising before the angle of the cell. Abdomen somewhat flattened. Hind tibiæ long haired above.

As far as known the genus is only represented in North America.

TABLE OF SPECIES.

1. Forewings with fascia, at one-third.....2.
   Forewing without such a fascia .....6.
2. Spots at end of cell distinct .....3.
   Spots obliterated by a transverse fascia .....4. **nothrotes.**
3. Forewings not obviously narrowed from anal angle .....4.
   Forewings narrowed from anal angle.....3. **quaintancella.**
4. Fascia angulated.....5
   Fascia curved .....5. **retectella.**
5. Fascia heavily shaded in costal portion.....1. **glandulella.**
   Fascia not so shaded .....2. **fractilinea.**
6. Ochreous-gray, a subcostal spot near the base.....6. **floridella.**
   Without such a spot.....7.
7. Pale yellowish-white; a streak in basal third.....7. **canfectella.**
   Pale creamy yellow; no such a streak .....8. **repartella.**

1. **V. glandulella** Riley. (Plate I, fig. 8, 8*a*.)—Head and thorax ashen gray, densely speckled with dark fuscous scales; antennæ dark fuscous, basal joint with pecten, grayish-ochreous; in the male stouter, deeply excised above basal joint with a strong scale tuft in the excision; shaft denticulate and shortly ciliate below; in the female more

slender, simple, and finely denticulate below. Labial palpi long, curved upward, decidedly stouter in the male than the female, grayish-white, the second joint externally, densely overlaid with dark fuscous scales, except extreme apex, third joint less densely speckled. Fore-wings moderately wide, margins nearly parallel from near the base to apical fourth, equally narrowed thence to apex, latter rather obtuse; ground color whitish, more or less densely overlaid with dark brown scales, forming a fairly constant pattern, a whitish fascia at one-third, curved outwardly and somewhat angulated in the fold, this fascia is shaded with dark fuscous within, which increases in density towards the base, outwardly the fascia is densely shaded with dark fuscous, which extends a little further along the costa than along the dorsal margin; two well marked spots at end of cell and immediately beyond these a transverse costal and dorsal spot, which form somewhat of a fascia, interrupted in the middle third, beyond these spots are six or seven, more or less well marked marginal dots; remaining surface more or less densely speckled with fuscous; cilia gray towards the base and speckled with white and fuscous scales; outer portion traversed by several ill-defined longitudinal lines. Hindwings over $\frac{1}{2}$, dorsal margin feebly convex, gray, dusted with fuscous; cilia under $1\frac{1}{2}$, gray, with pale basal line. Abdomen dark fuscous, segments margined posteriorly with whitish scales; anal bush grayish-ochreous. Underside of abdomen grayish-fuscous. Legs gray, suffused with fuscous, hind tibia with an oblique fascia at middle and at both ends paler; tarsal joints paler at apex. Expansion 16.0–23.0 mm., 0.64–0.92 inch.

Hab.—Atlantic States. Tex. (Dallas), Mo. (St. Louis), N. C., Cal. (Lake Co.) (Walsingham).

Larva in acorns. I have examined Zeller's type of *nubilella*. A female, bearing his green label—*Blastobasis nubilella* Z.; red type label 1714, locality label Dallas, Tex. Boll., compared with specimen of *glandulella* Riley, in my collection, found identical with the latter. Lord Walsingham's* reference to Mr. Chambers' and Mr. Riley's assertions concerning the identity of *nubilella* Zell., *triangularisella* Ch., and *sciaphilella* Zell., must be corrected as follows: *nubilella* Z., as there and above stated, is synonmyous with *glandulella* R.; *triangularisella* Ch., and *sciaphilella* Z., are the same and belong to *Holcocera*—sensu Clementi. The type of *sciaphilella* presents an anomaly in the neuration of the hindwings, as it has 8 veins on the left side (*Holcocera*) and 7 (*Blastobasis*) on the right, veins 3 + 4 are stemmed. This no doubt accounts for Mr. Busck referring this species to *Blastobasis*.

* Prov. U. S. Nat. Mus. Vol. XXXIII, p. 201.

2. **V. fractilinea** Zell.

Zeller describes this species as follows:

"Parva, alis ant. brevius culis; canis, striga ante mediam albida, in angulum fracta, pastice nigricani-marginata, punctu disci postum strigulaque venæ transversæ inferias incrassata nigris ♂.

"Palpi similar to those of *retectella* Zell., though a trifle shorter, dark fuscous externally, apex of second joint pale yellowish, third joint less acutely pointed and a trifle darker at the apex. Abdomen broad—as in retectella—pale yellowish gray, underside paler.

"Forewings $2\frac{1}{2}'''$ long, broad and obtuse as by *B. sciaphilella*, grayish-white, moderately dusted with blackish scales, more densely so on the basis, outer half of costal and dorsal margins. The transverse line before the middle forms a very conspicuous angle, more or less distinctly lined within with dark fuscous, an indistinct spot before the angle; externally distinctly lined with dark fuscous, which is widest towards the costa. Behind the apex of the angle, though a trifle higher, lies in the paler median space, a dark spot. Two coalescent brownish spots form a transverse bar, which almost attains the hind margin.

"Hindwings scarcely half the width of forewings, equally narrowed, rather sharply pointed with nearly straight posterior margin; grayish fuscous, cilia pale with a very fine, pale yellowish basal line." Two ♀♀.

Not known to me. Type and paratype in the Walsingham collection.

3. **V. quaintancella** n. sp. (Plate I, fig. 9.)—Head, basal joint of antennæ and thorax pale mouse gray, minutely speckled with fuscous; shaft of antennæ grayish-fuscous, very indistinctly annulate with pale; in the male stouter, excision above the basal joint not profound and projecting scale tuft small, finely denticulate and ciliate below; in the female more slender, simple. Palpi moderate, stouter in the male than female, grayish-white, densely dusted without, less so within, with dark fuscous, tip of second joint pale, the latter about one-third longer than the terminal joint. Forewings moderately wide, widest near the base, from thence very gradually narrowed towards the apex; ground color dirty white, overlaid with fuscous scales in varying density, basal third paler, limited externally by an ill-defined outwardly convex whitish fascia, which is subangulated about its middle, a dark dash in basal space beneath the fold, and a faint spot just before angle of fascia; outwardly the fascia is limited by an ill-defined costal and dorsal spot, remainder of the wing, especially along the margins more densely sprinkled with fuscous scales; a little beyond the angle of the fascia is a well marked, somewhat elongated, dark fus-

cous spot, two less distinct, roundish dots at end of cell, and beneath these on the dorsal margin a small patch; cilia gray, thinly dusted in their basal portion with whitish scales, interspersed with pale fuscous, two or three ill-defined longitudinal lines towards the apex. Hindwings narrow, lanceolate, scarcely over ½, gray, infuscate towards the apex; cilia 2, gray, with two or three longitudinal lines near the apex. Abdomen fuscous; anal bush ochreous, ventral surface pale ochreous, more or less suffused with fuscous, except last two segments. Legs whitish, more or less densely suffused and speckled with fuscous, tibiæ at base, an oblique band of posterior tibiæ above the middle externally and end of tarsal joints, pale. Expansion 12.0–14.5 mm., 0.48–0.58 inch.

Hab.—No exact locality given.

Six specimens from the Nat. Mus. Coll., without locality labels, were bred by Mr. Quaintance from apple, and it gives me pleasure to name this species in his honor. The specimens, which were not spread, vary more or less in distinctness of markings as well as density of the fuscous dusting. This species comes nearer to *glandulella*, from which it is at once distinguished by the much narrower hindwings and longer cilia of the same, its markings, though similar, are far less pronounced; in form of hindwings, it would appear to be close to *retectella*, with which it agrees in size.

4. **V. nothrotes** Wlsh.

Lord Walsingham's description of this species is as follows:

"Antennæ pale slaty-brownish. Palpi grayish-brown, with whitish sprinking. Head and thorax whitish, with grayish-fuscous speckling, especially in a band across the front of the thorax and another across the posterior end of the tegulæ. Forewings dirty white, profusely sprinkled with grayish-fuscous, of which a transverse fascia crosses the wing at one-third; this is slightly angulated outward in the middle, and partially diffused outward in the middle and about the costa; at the end of the cell a somewhat less defined, straight, transverse fascia occurs, absorbing the two spots which would otherwise appear at the end of the cell, corresponding to a small discal spot at about the middle of the wing; the apical area is thickly bestrewn and mottled with grayish-fuscous; cilia brownish-gray, sprinkled with whitish- and grayish-fuscous atoms. Hindwings brownish-gray; cilia slightly paler. Abdomen slaty-gray, anal tuft paler. Legs pale, brownish-gray. Alar expanse 12.0 mm."

Hab.—Arizona. *Type.*—Male, in the author's collection.

Lord Walsingham states further:

"A small and narrow winged species, somewhat similar in markings to *retectella* Zell., with which it agrees in having a strong notch and pecten on the antennæ, and 4 and 5 of the hindwings stalked, but is quite distinct in size and shape."

5. **V. retectella** Zell.

Of this species the author gives only a comparative description relative to his umbilella—*glandulella* Riley—as follows:

"A smaller American specimen, female, forewings 3‴ long, cannot be identified with either *nubilella* Zell., or *sequella* Zell., as the hindwings are still narrower and more pointed than in the former species. The forewings of this species—*retectella*—are not so dark as in *nubilella*. The transverse white line is simply convex outwardly and somewhat wavy, wider, and limited towards the base by an ill-defined spot of blackish scales; the strongly marked spot in the median space is present. The two spots at end of cell are represented by a heavy transverse spot. Hindmargin infuscate, without black spots. Ovipositor long, awl-shaped, depressed."

Hab.—Texas.

Unknown to me in nature. The type, a female, is in the Walsingham collection.

6. **V. floridella** n. sp. (Plate I, fig. 10.)—Palpi pale ochreous, dusted with fuscous externally, apex of second joint pale, lower edge of second joint somewhat roughened with dark brown scales; a little stouter in the male, terminal joint two-thirds the length of the preceding; female: slender, terminal joint three-fourths the length of the second. Head, basal joint of antennæ and thorax pale ochreous, the latter and vertex dusted with fuscous. Antennæ ochreous-fuscous, deeply excised above basal joint in the male with conical tuft in the excision. Forewings rather narrow, of nearly equal width for two-thirds, thence gradually narrowed to the apex, costal margin approximately straight for two-thirds, apical third depressed to the apex; ground color sordid ochreous, suffused with fuscous brown without any particular pattern, the dark colors more evident along the margins, also some longitudinal streaks, especially along the fold and below the costal

margin near the base, first discal spot and two at end of cell, distinct, though not equally so; from the former proceed two, not very distinct, divergent lines, consisting of white scales, margined with black scales and extending to the end of the cell, a row of black dots along the base of cilia; some scattered white scales in apical part of wing, a very distinct subcostal spot very near the base; cilia gray with some scattered dark scales in basal part. Hindwings scarcely over $\frac{1}{2}$, dorsal margin nearly straight from anal angle to the acute apex, gray, dusted with fuscous; cilia over 2, gray, basal half with yellowish tint. Abdomen grayish-fuscous, anal bush grayish-ochreous. Underside of body and legs gray, more or less densely suffused with purple brown; apices of tibiæ and tarsal joints paler. Expanse 11.0–16.0 mm., 0.44–0.64 inch.

Hab.—Florida (Crescent City).

Four specimens, one male and three females, in Nat. Mus. Coll., bear the label, "From ♀ cone of *Zamia integrifolia.*" Not clearly related to any of the species known to me. No indications of a fascia at one-third of forewing. The divergent lines in middle space of forewing are distinct in only one, indistinct in another, and obsolete in the remaining two.

7. **V. confectella** Zell. (Plate I, fig. 11.)

In "Anmerkung 1," in his description of *Hypatima subsenella*, Zeller very doubtfully refers a somewhat worn specimen from Texas to this species. The greatest difference he finds is the very narrow hindwings, without, however, recognizing the differences in venation. I herewith give his comparative description:

"The pale gray ground color of the forewings have a somewhat yellowish tint. A dark shade at the base of costa. Instead of the first costal spot, is a very fine line visible. The short plical line above the dorsal patch is wanting, and the latter extends further towards the base, while a longer line within the fold, and nearer the base is quite distinct and of which no trace is visible in *subsenella*. The streak before the end of the cell is wanting entirely and a costal spot immediately above those at end of cell is quite evident."

I have examined the type of this species, a female, in the Cambridge Museum, and offer the following complimentary notes in order to enable the recognition of this form in the future:

"Palpi, head, basal part of antennæ and thorax, sordid ochreous-white with some lustre. Palpi slender, the third joint two-thirds the length of the second, the latter dusted with fuscous externally. Thorax dusted with fuscous on the disk. Forewings sordid white, with a very faint yellowish tint, dusted with fuscous. Basal space not well defined externally, with a longitudinal line above the fold; a dorsal nebulous patch near the base; very faintly indicated patches on both margins at one-third, a longitudinal first discal spot and two spots at end of cell with faint costal patch above; apical part of wing more densely dusted. Hindwings scarcely $\frac{1}{2}$, costa retuse in outer half, grayish-white dusted with fuscous; cilia 2. Abdomen pale ochreous-fuscous. Underside pale ochreous-white. Legs ochreous-white; tibiæ and tarsal joints pale at the apex, fuscous externally." Expanse 12.0 mm., 0.48 inch.

Hab.—Texas (Dallas, Boll collector).

Veins 4 + 5 of hindwings stemmed, 3 before angle of cell. A male specimen in my collection, from Montclair, N. J., and received some years ago from Mr. W. D. Kearfott, agrees in every respect with this species, except that the dark line above the fold in basal space is replaced by an elongate nebulous patch. There is a faint nebulous costal patch beyond the middle and a small spot below the costa and just before the upper spot at end of cell.

8. **V. repartella** n. sp.—Entire insect pale creamy yellowish Head, thorax, and basal joint of antennæ very slightly touched with pale fuscous; antennæ (male) slender, slightly thickened towards the base, excision above basal joint not profound, projecting scale tuft long, shaft shortly ciliate, but not denticulate within, a trifle darker than the basal joint above, pale brownish beneath. Palpi (male) slender, long, terminal joint two-thirds the length of the second, dusted with fuscous, more densely without, leaving the base and apex pale. Forewings rather narrow, of approximate equal widths of basal half, thence gradually narrowed to apex, latter pointed; extreme costa in basal portion brownish fuscous, surface very slightly suffused with pale fuscous towards the base and reddish-brown towards the apex; a small, elongate spot in median space before the middle, a little nearer the costa than the dorsal margin, two scarcely perceptible dots at end of cell, along the base of costal cilia are four or five somewhat elongate spots, and a similar one just below the apex on the dorsal margin; cilia concolorous with a few scattered pale brown scales. Hindwings $\frac{2}{3}$, dorsal margin very slightly curved from base to apex, whitish, slightly infuscate towards the apex, with some lustre; cilia $1\frac{1}{2}$, grayish-white. Abdomen above yellowish-gray, anal bush concolorous; under-

side yellowish. Legs more or less densely tinged with fuscous, especially the anterior; tarsal joints scarcely paler at apex. Expansion 15.0–18.0 mm., 0.6–0.72 mm.

Hab.—Colorado, Denver.

Two ♂♂, in the Nat. Mus. Coll., collected by E. Oslar. One of these is minus its left fore- and hindwing, which are contained in a slide; the other is minus its left forewing. The pale, yellowish color distinguishes this species at once from all others at present known to the writer. I retain the MSS. name given it by Mr. Busck.

EURESIA gen. n.

Type *pulebella*.

Labial palpi long, diverging, pending (in the dead insect), second joint rather thick, roughened beneath with scales, third joint shorter than the second, slender, and like the latter roughened beneath with scales. Antennæ (♂) shorter than the forewing; basal joint short and broad, pecten setaceous, shaft deeply excised above the base, neither denticulate or ciliate beneath. Forewings moderately elongate, pointed, twelve veins, vein 7 + 8 stemmed, 7 to costa, remaining veins free, but crowded at end of cell, posterior angle of latter very close to dorsal margin. Hindwings much narrower than the forewings, lanceolate, pointed, costa slightly retuse in outer half, cilia long; eight veins, vein 4 before angle of cell, 5 + 6 free. Posterior tibia rough haired above.

Represented by a very small species strongly resembling and readily to be taken for a *Pigritia*. Distinguished from the latter by its long palpi and hindwings with eight veins. From the other genera of Blastobases with eight veins in the hindwing, by veins 2, 3 + 4 of the latter arising from the posterior median vein.

E. pulchella n. sp. (Plate II, figs. 12, 12*a*.)—Palpi ochreous, dusted with fuscous without and within, leaving apices of joints pale. Head ochreous, lightly touched with fuscous. Antennæ fuscous-brown, excised above base, basal joint ochreous, tinged with fuscous, pecten gray. Thorax ochreous-fuscous. Ground color of forewings pale ochreous-brown, a rather wide, silver white fascia at one-third, not sharply defined within, more so externally, approximately straight

slightly curved outward at dorsal margin, and heavily shaded externally with dark brown, first discal large about middle of wing length, two spots at end of cell, almost obscured by a slightly oblique, straight fascia, middle and apical spaces more or less suffused with brown; a rather dense sprinkling of white scales before the fascia at end of cell, more especially in dorsal portion, some similar scales in apical third. Cilia gray, with about four pale lines sprinkled with white and brown scales near base. Hindwings pale gray, dusted with fuscous; cilia over 2, gray, tinged with ochreous towards the base. Abdomen grayish-fuscous; anal bush grayish-ochreous. Underside of body grayish-white, with silvery lustre. Legs ochreous-white; tarsi, especially posterior, fuscous externally, apices of joints paler. Rough hairs of posterior tibiæ pale ochreous. Expanse 8.5 mm., 0·34 inch.

Hab.—Washington, D. C. A unique male specimen collected by Mr. A. Busck, June, 1902.

CALOSIMA gen. n.

Type *argyrosplendella*.

This genus differs from *Holcocera* in the presence of a conchiloidal shield of close set scales, on the basal joint of the antennæ instead of a pecten and the absence of discal spots or other markings of the forewings.

The head is rather small and depressed, the face strongly receding, giving thus the thorax a somewhat more convex appearance as is usual in this group. The palpi are long, slender and recurved, the second joint scarcely thickened towards the apex. The antennæ are not excised above the basal joint in the male. Forewings more of less elongate, acutely pointed; 12 veins, 7 + 8 stemmed, 7 to costa. Hindwings 8 veins, 3 + 4 connate or short stemmed, 5 connate with the stem.

In appearance the two species here described have rather an Œcophorid habitus than that of a Blastobasid. The venation, however, admits of no doubt. This genus holds the same relationship to *Holcocera* as *Zenodochium* holds to *Blastobasis*.

The two species, though closely allied, may readily be distinguished as follows:

Larger, extreme costa pale, hindwings obtusely pointed.....**dianella.**
Smaller, extreme costa dark brown, hindwings acutely pointed.
argyrosplendella.

1. **C. argyrosplendella** n. sp. (Plate II, figs. 13, 13*a*, 13*b*.)—Palpi white, dusted externally with fuscous, slender, third joint nearly as long as the preceding one, pointed. Head white, with pearly lustre. Antennæ pale grayish-fuscous, basal joint white, instead of pecten, a large conchyloidal shield of close set white scales, longer than width of joint; stalk grayish-fuscous paler towards the base, not excised above in the male, shortly pubescent beneath. Head and thorax white, with pearly lustre, lightly flecked with a few pale fuscous scales, the latter more in evidence on the thoracic disk. Forewings elongate, widened outwardly, costa slightly convex at the base, thence nearly straight and not strongly depressed towards the apex; pale yellowish white with strong lustre, extreme costal margin dark brown, lightly suffused with pale reddish-brown in apical portion; underside fuscous. Hindwings nearly 1, rather strongly narrowed towards the acutely pointed apex, costa retuse in outer three-fifths; pale grayish-white, lustrous; cilia a trifle over 1; underside white. Abdomen grayish-white, somewhat fuscous towards the base, with a certain lustre. Anal bush yellowish-white. Underside of body and legs, silvery white, with lustre, the anterior legs somewhat suffused with fuscous, tarsi likewise; brush of hind tibia white, Expanse 10.5–12.0 mm., 0.43–0.48 inch.

Hab.—Pennsylvania (Hazleton, July 4, 1906); La. (Vowells Mill, April, 1902); Fla. (Hastings, May 16, 1902).

Differs from *dianella* by its narrower wings, acutely pointed hindwings, costa of forewings nearly straight, generally paler color and smaller size. Three specimens in my collection, from as many localities, would seem to indicate a rather wide distribution of this interesting addition to our fauna.

2. **C. dianella** n. sp.—Palpi slender, reaching to antennal insertion, sordid white, dusted externally with fuscous, the third joint three-fourths the length of the second. Head and thorax creamy white, the former very smooth scaled with a greenish lustre, the latter lightly dusted with pale ochreous-fuscous with some lustre. Antennæ slender, simple; slightly pubescent beneath and not excised above the base in the male; basal joint of moderate length, slightly curved, nearly twice as long as wide, creamy white, conchoidal shield of long, close set scales, concolorous with basal joint. Forewings relatively wide, costa slightly convex from the base, sharply pointed, creamy yellow, thinly overlaid with pale ochreous-fuscous except for three-fourths of the costal margin, which is thus left paler; no markings; cilia pale ochreous-yellow. Hindwings as wide as the forewings, rather obtusely pointed, costa not retuse, except a slight sinuosity beyond inser-

tion of vein 8; grayish-white, slightly dusted with fuscous; cilia gray, 1; abdomen grayish-fuscous above; anal bush gray. Underside of body and legs silvery white, anterior and middle legs rather thickly the posterior slighly dusted with fuscous. Expansion 13.5 mm., 0.54 inch.

Hab.—Georgia (Forsyth). A male specimen in my collection, collected in 1895.

In coloration this species does not differ from the preceding, except perhaps in the more pronounced yellow, it is, however, larger, wings relatively wider, the hindwings obtuse at apex, and vein 10 of forewing is somewhat removed from angle of cell; 3 + 4 of hindwing from a very short stem, 5 subconnate with the latter.

HOLCOCERA Clem.

Type *chalcofrontella.*

Catacrypsis Wlsh., *Cynotes* Wlsh., *Prorodica* Wlsh., *Hypatopa* Wlsh. (*Hypatima* H. S.).

Tongue long, scaly at base. Labial palpi long, ascending, generally recurved. Antennæ about three-fifths the length of the forewings, basal joint broad with setaceous pecten; shaft either excised above the basal joint in the male, or else similar in the sexes, frequently ciliated in the male. Forewings more or less elongated, pointed, without scale tufts; 12 veins, 7 + 8 stemmed, 7 to costa before the apex; rest of veins free. Hindwings ovate to lanceolate ovate, generally acutely pointed; costa more or less retuse beyond insertion of vein 8. All veins present, 3 + 4 generally stemmed, rarely connate, 5 free, connate with stem of 3 + 4 or arising from stem of the latter. Brush of bristly hairs of hind tibia always well developed.

The genus as here defined comprises a rather large number of species of diverse appearance and habitus. They are generally attracted by light. Of their primary stages, food plants, etc., but little is known.

Clemens in his description of the genus says: "A furcate apical branch near its end (the anterior median), the lower branch running into the apex of the wing." This is not the

case, as this branch (vein 7) goes to the costa, though close before the apex. Veins 3, 4 and 5 of hindwings vary greatly in their origin, not only in different species, but in different individuals of the same species and even in the same individual.

In the following table I have endeavored to proceed from the broad winged and dark colored forms to those with narrow wings and of light color, but from the nature of things this could not always be carried out. *Holcocera arizonella* Krft. belongs to *Colinita* Busck. (*Scythris* Hbn.).

TABLE OF SPECIES.

1. Antennæ of male excised above basal joint .....2.
   Antennæ of male not excised above basal joint.....21.
2. Antennal cilia of male 1, or over; excision very deep .....3.
   Antennal cilia of male scarcely exceeding one-half; excision less deep.....7.
3. Markings of forewings not in longitudinal streaks.....4.
   Markings of forewings in longitudinal streaks.....6.
4. Ground color white.....3. **estriatella.**
   Ground color not white.....5.
5. Forewings dark purple-brown .....1. **dives.**
   Forewings tawny, fuscous-gray .....2. **aphidiella.**
6. Larger, with longitudinal striæ in apical part of wing. 4. **gigantella.**
   Smaller, without such striæ .....5. **nigristriata.**
7. Ground color gray or fuscous.....8.
   Ground color not gray or fuscous.....13.
8. Unicolorous .....6. **purpuricomella.**
   Not unicolorous.....9.
9. Head, thorax, and base of forewings yellowish. 7. **ochrocephala.**
   No such characters.....10.
10. A v-line within the dorsal margin, antennæ very robust. 8. **crassicornella.**
    No such line, antennæ at most moderate.....11.
11. Basal third of forewing paler, limited externally by an angulated line .....9. **modestella.**
    Basal third of forewing not paler.....12.
12. Dark fuscous-brown, wings wider.....10. *var.* **fumerella.**
    Grayish-fuscous, wings more elongate.....10. *var.* **quisquiliella.**
13. Ground color of forewings ochreous .....14.
    Ground color of forewings whlte .....15.

14. Conspicuously mottled with dark fuscous, two spots at end of cell.....10. **chalcofrontella.**
Not conspicuously mottled, five dots at base of apical third. 17. **maligemmella.**
15. A fascia at one-third, more or less distinct.....16.
No fascia at one-third,.....19.
16. Fascia oblique.....16. **iceryaecella.**
Fascia curved or angulated.....17.
17. Two furruginous spots in median space.....12. **busckiella.**
No such spots .....18.
18. Larger, costal part of fascia very conspicuous ...13. **sciaphilella.**
Smaller costal part of fascia not more conspicuous than dorsal 11. **confluentella.**
19. A large costal spot at two-fifths.....14. **plagiatella.**
Without such a spot.....20.
20. A streak above basal part of fold.....15. **livorella.**
Without such a streak.....18. **gilbociliella.**
21. Forewings fuscous.....22.
Forewings not fuscous .....24.
22. Basal space paler, angulated externally .....21. **stygna.**
Unicolorous .....23.
23. Discal spots present, hind wings grayish-fuscous.....19. **funebra.**
Discal spots obsolete, hind wings, semi-transparent, 20. **inconspicua.**
24. Forewings ochreous-brown .....25.
Ground color of forewings white .....27.
25. Expands 10 mm.....24. **nana.**
Expands 15 mm. or more .....26.
26. A patch of white scales in basal space.....22. **boreasella.**
Without such scales .....23. **nucella.**
27. With marginal spots .....28.
Without such spots.....45.
28. Without a spot on posterior margin of cell.....29.
Posterior margin of cell with a spot in middle space.....39.
29. With conspicuous longitudinal streaks .....25 **elyella.**
Without such streaks.....30
30. A row of spots between first discal spot and end of cell. 26. **insulatella.**
Without such a row of spots.....31.
31. One or two dark dashes in basal space.....32.
Without such dashes .....35.
32. Two dashes in basal space .....33.
One dash in basal space.....34.
33. Fascia at one-third entire.....28. **simulella.**
Fascia at one-third interrupted .....29. **messelinella.**

34. A large triangular dorsal patch .....30. **morrisoni.**
Without such a patch .....31. **fluxella.**
35. Fascia very pronounced.....36.
Fascia ill-defined.....37.
36. Head and thorax purplish-fuscous .....27. **inclusa.**
Head and thorax whitish.....32. **clemensella.**
37. Larger, 20 mm .....33. **irenica.**
Smaller, 13–14 mm.....38.
38. Gray, fascia nearly obsolete .....34. **illibella.**
White, fascia fairly distinct .....35. **crescentella.**
39. Fascia straight .....36. **spretella.**
Fascia curved or angulated.....40.
40. Without a dash in basal space.....41.
With one or two dashes in basal space.....42.
41. Head and thorax bone-white .....37. **ursella.**
Head and thorax gray as fuscous .....38. **punctiferella.**
42. Head and thorax silvery white .....40. **vestaliella.**
Head and thorax grayish-fuscous.....43.
43. Smaller, 10 mm.....42. **pusilla.**
Larger, 13–15 mm.....44.
44. With median costal spot.....39. **zelleriella.**
Without such a spot.....41. **tartarella.**
45. Markings rusty red .....43. **rufopunctella.**
Markings blackish-brown .....46.
46. A straight subcostal line before the middle..44. **melanostriatella.**
A curved line beyond the middle.....45. **interpunctella.**

1. **H. dives** n. sp. (Plate II, fig. 14.)—Head bronze, with cupreous bronze lustre; antennæ fuscous with a slight sheen; in the male, deeply excised above the base, scale tuft truncate, shaft slightly thickened towards the base, strongly ciliate, cilia over 1, pale gray. Palpi long, slender, a trifle more so in the male than the female, dark brown, third joint a little shorter than the second, slightly suffused with pale, especially within and towards the apex. Thorax and forewings a rich, deep bronze brown with considerable lustre, of moderate width, costa nearly straight from near its base to apical fifth, thence equally narrowed to apex; discal spots obsolete; the brown scaly covering is intermixed with very fine, grayish hair-like scales, only visible under a strong lense; cilia fuscous-gray, darker around the apex. Hindwings almost 1, fuscous-brown with a somewhat greenish, metallic lustre, cilia under 1, fuscous-gray. Underside of forewings fuscous, hindwings paler. Abdomen dark, bronze brown above, grayish-fuscous beneath, anal bush small, dark gray. Legs dark brown, posterior a trifle paler, femora with greenish metallic lustre, tarsal joints obscurely paler at the apex; underside of thorax fuscous, with pronounced greenish, metallic lustre. Expanse 16.0–19.0 mm.

Hab.—Penna. (Hazleton, Charleroi), Can. (Toronto), Md. (Plummer's Island).

Seven specimens, two ♂♂ and five ♀♀, are before me. Closely related to *H. aphidiella*, from which it is distinguished by its uniform dark brown color of forewings and absence of discal spots.

Var. BASIPALLIDELLA differs from the typical form by the basal two-fifths of the forewing being somewhat paler than the rest of the wing, this paler space is irregularly angulated externally, and the first discal spot is situated on its edge; the two spots at end of cell are generally distinct, and the immediate space surrounding them a trifle paler. Expansion 16.0–18.0 mm., 0.64–0.72 inch.

Hab.—Penna. (Hazleton), Mass. (Cohasset), New Hamp. (Hampton).

Both the typical form and the variety lack entirely the white tipped scales of *aphidiella*.

2. **H. aphidiella** Wlsh.—"Antennæ strongly notched beyond the basal joint, the basal extremity of the notch very plainly indicated by a truncate patch of scales from the lower margin of which the slender bent stem continues; beyond this they are biciliate three-fourths; basal joint with a strong scale-pecten; tawny-gray. Palpi slender, pointed, slightly recurved reaching, beyond the basal joint of the antennæ, the terminal joint nearly as long as the median; brownish cinereous, the median joint darkened externally. Head and thorax with an iridescent greenish lustre; tegulæ tipped with cupreous. Forewings with 12 veins, 7 and 8 stalked, 7 to costa; tawny reddish-gray; a darker discal spot, a little beyond one-third, is succeeded by a larger spot (or confluent pair of spots) at the end of the cell; below which the outer extremity of the fold is also dark shaded; cilia brownish cinereous; underside not iridescent. Hindwings with 8 wings, 5 out of the stalk of 3+4; rather shining, brownish-gray with greenish and cupreous iridescens towards the base; cilia brownish cinereous, with a slight ochreous tinge; underside decidedly iridescent. Abdomen brownish cinereous. Legs brownish cinereous. Alar expanse 13.0 mm."

Hab.—United States, probably Washington City. "Pupa in gall of Phylloxera on Carya alba, etc."

The above is Lord Walsingham's description, though not in the same sequence. I have examined the type in the Nat.

Mus. Coll. The author does not mention the interspersion of white tipped scales on the forewing. The similarity to *quisquiliella* Zell., as remarked by the author, is considerable, but the latter lacks the greenish-cupreous reflections, and the white tipped scales of forewing; it is a larger insect, the male antennæ less deeply excised, cilia under $\frac{1}{2}$, the modding more pronounced; altogether it is a lighter colored insect.

3. **H. estriatella** n. sp. (Plate II, fig. 15.)—Head rather narrow, ochreous, tinged, especially on the face with fuscous. Antennæ (♂) rather robust, basal joint ochreous, fuscous on the disk, pecten long, fuscous, shaft fuscous, paler toward the tip, indistinctly annulate with ochreous, finely denticulate and ciliate beneath, deeply excised above the base; cilia 1. Palpi long, slender, reaching considerably above level of head, second joint dark fuscous without, paler within, extreme apex, like the third joint, whitish, latter very slender, as long as the second, very sparsely speckled with pale brownish scales. Thorax shining, ochreous, disk suffused with fuscous, patagia paler, purplish-brown anteriorly. Forewings moderately wide, not widened exteriorly, costal margin very slightly depressed about the middle; ground color white, overlaid in varying density with dark purplish-brown, as follows: Base dark, shading off outwardly at one-third, the ground color forms an outwardly sharply angulated fascia, not defined within, sharply so without, summit of angle on the fold, the fascia recedes a trifle outwardly on the costa, externally the fascia is heavily shaded with very dark fuscous-brown, more so on the costal portion, where it extends to the outer third, but is somewhat interrupted about the middle; the remainder of the middle space is less densely speckled with dark fuscous, except along the fold, first discal stigma absent, two large, coalescent spots at end of cell, below which and a trifle outwardly is an ill-defined spot on the dorsal margin, an oblique costal blotch beyond the second discals, not reaching middle of wing, remainder of apical part of wing speckled with fuscous, the latter forming an ill-defined curved line before the apex, a dark line along base of cilia around the apex, most marked at extreme apex; cilia gray, basal part speckled with white, intermixed with fuscous scales. Hindwings nearly 1, gray, with sheen, dusted with fuscous; cilia under 1, gray, paler outwardly. Underside of forewings dark, hindwings pale fuscous. Abdomen fuscous, anal bush pale. Legs fuscous-brown, anterior more so, hind tibiæ with an oblique pale spot about the middle, apices of same and apices of tarsal joints whitish. Expanse 15.0 mm., 0.6 inch.

Hab.—Mass.

A male specimen, without exact locality, in my collection.

Very distinct and easily distinguished from the other species of this group, having the deep excision and long cilia of the male antennæ.

4. **H. gigantella** Ch.—Head, thorax, and palpi white, more or less dusted and finely speckled with fuscous. Antennæ grayish-fuscous above, brownish beneath, basal joint and pecten white, speckled with fuscous; in the male deeply excised above the basal joint with truncated scale tuft, cilia a trifle over 1. Palpi slender, ascending, not recurved, about equal in the sexes, terminal joint about three-fourths the length of the second, speckled, especially externally, with dark fuscous scales. Forewings elongate, equally narrowed from apical fourth, ground color white, more or less dusted and speckled with fuscous, veins and a line in the fold, dark fuscous; cilia gray, sprinkled with white, intermixed with fuscous scales around the apex. Hindwings over 1, yellowish-gray, dusted with fuscous, veins darker; cilia under 1, yellowish-white with an indistinct, subbasal dark line. Underside of forewings fuscous, darker towards the costa; hindwings grayish fuscous. Abdomen above and underside of body, whitish, segments above with a line of brownish scales before the posterior margin. Legs white, strongly suffused with blackish externally, leaving the ends of tibiæ and tarsal joints white; hind tibæ strongly rough haired, hairs white. Expansion 30.0 mm., 1.2 inch.

Hab.—Colo., Cala. (San Luis Obispo).

Five specimens, two males and three females, in my collection, four of these are from the last-named locality, and have the ground color of the forewings more suffused with fuscous. Chambers supposed this species to feed upon yucca. Not easily confounded with any other species of this genus. The dark fuscous lines of the forewing, corresponding with the neuration, give it a very distinct appearance, which is approached only by the following species (*nigristriata*), the latter, however, is much smaller and lacks the dark lines in the apical part of the wing.

5. **H. nigristriata** Wlsh.

The author describes this specimen as follows:

"Antennæ yellowish; basal joint considerably widened, with strong pecten, dirty whitish. Palpi white, sprinkled with blackish scales, very densely on the outer side. Head and thorax white, sprinkled with blackish scales. Forewings white, much sprinkled and striated with blackish scales; an elongate patch of these scales extends from the base along the fold to about one-sixth, and is diffused downward

to the flexus; a narrower streak from the base near the costa extends to a little beyond one-third, running parallel with the costa, but not touching it; beyond this, and a little further removed from the costa, a shorter but darker streak follows the upper edge of the cell to its outer extremity; two other streaks, commencing rather nearer to the base, are situated on the cell and on the fold respectively, while there is an indication of two dark dots at the end of the cell, scarcely more conspicuous than the blackish dusting which is generally distributed around them, and especially along the margins to the apex; cilia pale yellowish-brown, speckled with white and fuscous. Hindwings shining, pale brownish-gray; cilia yellowish. Abdomen whitish, with transverse fuscous lines. Legs whitish." Expansion 13.0 mm.

Hab.—Arizona. Two ♀ ♀.

Type in the author's, paratype in Nat. Mus. Coll. The latter I have examined. The dark streak in the fold extends the entire length of the latter. Its relationship to *gigantella* has been referred to under that species. Although the male is not known, I entertain scarcely a doubt that the species belongs into the section—"Antennæ of male excised above the base"—*Holcocera* sensu Clemensi. In the synoptic table I place it tentatively next to *gigantella*, its nearest ally.

6. **H. purpurocomella** Clem.—"Forewings uniform dark purplish-fuscous, with an indistinct, blackish median dot, and two of the same hue in the middle of the wing above the fold. Hindwings dark yellowish-fuscous, cilia same. Head and thorax fuscous with a reddish hue. Face tinted with yellowish. Labial palpi fuscous."

The above is Dr. Clemens' short description. The type, a female, in fairly good condition, is in the Clemens' collection at the Academy of Natural Sciences, Philadelphia. A number of specimens in my own collection. The labial palpi are long, recurved, a trifle more slender and longer in the female than the male, the third joint two-thirds the length of the second, sordid ochreous, densely dusted with dark fuscous, less so towards the apex, the lower edge somewhat roughened with dark fuscous scales. The head and basal joint of antennæ are sordid ochreous, more or less densely speckled and suffused with reddish fuscous. Antennal shaft fuscous, slender; in the male moderately excised above the base, with obliquely truncated scale tuft, ciliated; cilia scarcely $\frac{1}{2}$. The purplish fuscous coloring of

the forewings is uniform, though more pronounced in costal portion of the wing; a slightly paler shade, especially before the first discal and surrounding the spots at end of cell is noticeable in some specimens. The first discal spot before the middle, and the two spots at the end of cell, are quite distinct in the type and all specimens before me. Hindwings nearly 1, with considerable lustre, cilia under 1, paler than the wing. Abdomen fuscous, paler beneath; anal bush ochreous. Legs fuscous, especially anterior and median; hind tibia dark gray with median band externally and at apex, paler; rough haired above; tarsal joints paler at apex. Expansion 17.0–18.5, 0.68–0.94 inch.

Hab.—Penna., Maryland (Plummer's Island). Occurs undoubtedly over whole Atlantic district.

Might be confounded with *H. dives*, but differs, by its smaller size, relatively broader forewings, well marked discal spots, paler coloring and less lustre, and above all by the less profound excision and much shorter cilia of the male antennæ. Agrees in wing form and antennal structure with *chalcofrontella*, and resembles somewhat var. *fumerella* of that species, but lacks the mottling of the latter.

7. **H. ochrocephala** n. sp.—Head, thorax, and palpi pale ochre-yellow; the latter long, ascending but slightly recurved, terminal joint almost as long as the second, speckled, especially externally, with fuscous scales, leaving the apices of second and terminal joints paler. Basal joint and two or three basal joints of shaft of the antennæ yellowish-white, very slightly speckled with fuscous, remainder of shaft grayish-fuscous, anterior (exclusive of patagia) and posterior margin of thorax dark purplish-brown. Forewings moderately wide, grayish-fuscous, suffused in patches with dark fuscous, and overlaid with purple, extreme base, excepting its costal margin, pale ochre-yellow; first discal spot distinct, before the middle and nearer to the costal margin, two spots at end of cell less distinct, coalescent, cilia grayish-fuscous, paler at base. Hindwings 1, grayish-fuscous; cilia scarcely over $\frac{1}{2}$, grayish-fuscous, paler at base; vein 5 out of stalk 3 + 4. Abdomen above fuscous, beneath sordid yellowish-white, anal segment deep ochreous. Underside of thorax and legs pale ochre-yellow, speckled more or less densely with fuscous, leaving the ends of tibiæ and posterior tarsal joints paler. Expansion 16.0 mm., 0.64 inch.

Hab.—W. Va. (Aurora), Md. (Frederic).

A female specimen in the Nat. Mus. Coll., collected by Mr. O. Heideman, and a male in my own, are before me. Unlike any other species. The pale yellow color of the head, thorax and base of forewing gives this insect a characteristic appearance. The somewhat moddled appearance of the remainder of the forewing resembles *chalcofrontella*, var. *fumerella*, but is paler.

8. **H. crassicornella** n. sp. (Plate II, fig. 16.)—Palpi rather robust, terminal joint three-fourths the length of the preceding, gray, rather densely sprinkled externally with dark fuscous, lower margin and apex of second joint paler. Antennæ robust, rather deeply excised (male) above the base, with a large conical scale tuft, ochreous above shading to fuscous beneath, ciliate, cilia ½. Head gray, suffused with dark fuscous. Thorax grayish-fuscous anteriorly with a blackish-brown transverse line behind the anterior margin, which extends upon the patagia; posterior two-thirds a sordid ochreous, dusted with gray. Forewings rather wide, ground color ashy-gray, overlaid in varying density with dark fuscous, broad scales, interspersed with narrow, hair-like pale scales; the dark scales are aggregated into irregular patches here and there, especially along the costal margin; before the middle and close to the dorsal margin are two short lines, converging into a point towards the base, between these the ground color is rather pale, immediately behind the base of this triangle the wing is speckled with dark scales, first discal spot at two-fifths, large and distinct; at the end of the cell are two very distinct, somewhat remote spots connected by a fine black line, the lower one of these spots is triangular with apex directed towards the base, in the apical portion of the wing is a strongly angulated line, a series of four large spots along the base of costal cilia, some less defined ones along base of dorsal cilia. Cilia gray, with about three pale, not very distinct, longitudinal lines in outer half, the outermost of these lines occupies the outer margin of the cilia. Hindwings about 1 (?); fuscous; cilia under 1, gray, with pale basal line. Abdomen pale grayish-fuscous beneath, anal bush the same. Legs dark gray, anterior and middle spotted with blackish, posterior tibia at base and oblique band at middle exteriorly, whitish; tarsal joints slightly paler at apex. Expansion 15.0 mm., 0.6 inch.

Hab.—Florida.

A unique male specimen, simply labeled "Florida," in the Nat. Mus. Coll. Very distinct and unlike any other. The antennæ—male at least—are very robust, the wing markings quite peculiar.

9. **H. modestella** Clem.—"Forewings fuscous, the basal portion of the wing paler and shining, and has a faint grayish hue; in the middle of the wing is a dark fuscous spot. Antennæ, head and labial palpi fuscous." The above very short description by Dr. Clemens needs amplification. Labial palpi long and slender; head and thorax grayish, speckled with fuscous. Forewings relatively wide, the basal third limited externally by an angulated line, the dorsal extremity of which is nearer the base than the costal end, the summit of the angle nearer to the costa; this space is grayish white, shining, dusted with, and especially along the margins, dark fuscous-brown, an ill-defined black spot before the summit of the angulated line, remainder of wing dark gray, densely overlaid with dark fuscous, especially in costal half of wing; a dark spot before the middle of wiug just beyond summit of angulated line, two ill-defined spots at end of cell; the apical part of the wing is slightly sprinkled with whitish scales; cilia gray, sprinkled with fuscous. Hindwings not quite 1, pale fuscous, cilia paler. Abdomen fuscous. Legs grayish fuscous; hind tibia with an oblique, whitish, median band, tarsal joints paler at apex. Expansion 15.0–16.0 mm., 0.6–0.64 inch.

Hab.—Atlantic States.

The type in fairly good condition in the collection of the Amer. Entom. Society, Philadelphia, is a female, which I have carefully compared with a specimen in my collection, also a female. I have seen no male, and the presumption that the male antennæ are excised above the basal joint rests entirely on the fact that Clemens placed it in his genus *Holcocera*—antennæ excised above the basal joint. Mr. Busck's statement* that this species is identical with *Blastobasis nubilella* Zell., and *Holocera glandulella* Riley, is erroneous. The last two named refer to one species and belong to the genus *Valentinia* Wlsh.

10. **H. chalcofrontella** Clem. (Plate II, figs. 17, 17*a–d.*)—Head, basal joint of antennæ and palpi, sordid yellowish, latter long, recurved, third joint scarcely shorter than the second, the latter externally except at tip, the terminal one entirely, thickly dusted with dark fuscous. Stalk of antennæ fuscous, except at its base; excised above basal joint with conical scale tuft and shortly ciliate in the male. Thorax sordid yellow, dusted with fuscous, anteriorly purplish-fuscous. Forewings relatively wide, ground color sordid yellowish or yellowish-white, dusted with dark fuscous-brown, the dusting con-

* Proc. Ent. Soc., Wash., Vol. V, p. 213.

densed into spots and blotches, an elongated patch at basal part of costa, an irregular spot at one-third, a larger one at three-fifths and another smaller one at about three-fourths of costa, from the latter begins a strongly curved or subangulated line in apical part of wing which ends in a spot on the dorsal margin beneath the end of cell; from the second costal spot starts an irregular angulated line or fascia, which ends in a dorsal spot just before the middle, this line reaches to the very distinct first discal spot above the fold, and also another less distinct spot beneath the fold. Two well marked spots at end of cell; a row of dark spots along periapical margin which send short streaks into the basal half of the cilia; there is some condensation of the dusting along the fold, and a more or less distinct blotch on the dorsal margin near the base. Cilia yellowish-gray, with a pale line before the middle and another less distinct before the free margin. Hindwings nearly 1, obtusely pointed, yellowish-gray, dusted with fuscous and having considerable lustre; cilia pale grayish-yellow, with pale basal line. Abdomen grayish-fuscous above, grayish-ochreous beneath, especially towards the end, anal bush grayish-ochreous. Legs pale grayish-yellow, dusted and spotted with fuscous, ends of tibiæ, an oblique band on posterior tibiæ externally and ends of tarsal joints paler. Expansion 14.0–16.0 mm., 0.52–0.64 inch.

Hab.—Atlantic and probably Middle States.

The two specimens representing the types in the Clemens' collection at the Academy of Nat. History, Philadelphia, and labeled as such by Mr. Busck are not identical, the specimen bearing label 201 is the type and corresponds with the description. The other specimen marked 202 and marked light variety, corresponds rather with *modestella* Clem.

I have bred this species in considerable number from the fruit racems of sumach—*Rhus typhosa*—collected end of July. The imagines appearing from middle to end of the following June. It is my opinion that the larvæ is predaceous on other larvæ.

There are several variations from the typical form which require special mention.

Var. **minorella.** (Plate II, fig. 17*e*.)

A somewhat smaller form, of which six specimens are before me, four in the Nat. Mus. Coll. and two in the collection of Mr. W. D. Kearfott. They all bear the label "Lewisburg, Pa.," bred from chestnut burrs. Four of the specimens have the dark dusting of the forewings much more dif-

fused, whereby the distinct spots and blotches of the typical form become more or less obliterated. Discal spot and two at end of cell distinct, a small spot of the pale yellow ground color immediately before the lower spot at end of cell. Two of the specimens—Mr. Kearfott's—have the dusting less diffused, in fact are lighter than typical specimens. The wings in this variety appears to be relatively narrower than in the former. It may prove a distinct species. Expansion 13.0–15.0 mm., 0.52–0.6 inch.

Var. **fumerella.**

Differs from the typical form by its general dark coloration. Head, basal joint of antennæ, palpi and thorax sordid, grayish-ochreous, dusted and speckled more or less densely with fuscous. Forewings grayish-fuscous; markings as in the typical form. The ground color in some specimens has a slight ochreous tinge. Expanse 17.0–18.5 mm., 0.68–0.74 inch.

Have bred this form likewise from the fruit racems of sumach. It is distinctly larger in size than the typical form, wings relatively broader. Rubbed or flown specimens might be confounded with *H. purpurocomella*, but in the latter species, aside from the absence of markings of forewings, the head, thorax, antennæ and palpi are grayish-fuscous.

Var. **quisquiliella** Zell.

Differs from the typical form by its more elongate and pointed forewings, its relatively narrower hindwings; dusting of forewings the same, but more suffused; appearance of insect more gray with a pale yellowish tinge—possibly due to fading: From *minorella* by its larger size, different wing form and less diffused fuscous dusting. From *fumerella* by its decidedly narrower wings, smaller size and paler coloration. Expanse 17.0–18.0 mm., 0.68–0.72 inch.

Hab.—Tex. (Dallas).

I have examined the type specimens in Cambridge Museum. Three of these bear Zeller's green labels, number 1712:—Dallas, Texas Boll. In all of these veins 3 + 4 are stemmed, 5 arising out of the stem.

11. **H. confluentella** n. sp. (Plate II, fig. 18.)—Head, basal joint of antennæ and palpi, yellowish-white, the latter long and slender, terminal joint three-fourths the length of second, the latter densely dusted with dark fuscous within and without, the terminal joint moderately dusted toward the apex without, scarcely at all within. Antennæ slender in both sexes, basal joint dusted with fuscous, stalk pale grayish-fuscous, deeply excised above the base and ciliate in the male, cilia nearly 1. Thorax yellowish-white, more or less densely dusted with purplish-fuscous, especially on the disc, and like the head with a certain metallic lustre. Forewings of moderate width, pointed, ground color white, dusting and markings deep purple-brown; a sharply angulated dark brown fascia at one-third, the summit of the angle is somewhat quadrangular and close above the fold, before this fascia the dusting is slight, but increases in density towards the base, outwardly the fascia shades gradually into the median space in about equal width, but is slightly interrupted just about the middle of the wing, and is equidistant from the base at the wing margins; a large semicircular costal spot at three-fifths, ill-defined towards the disc; first discal spot obsolete, or rather obscured by the fascia, two spots at end of cell distinct, subconfluent, a rather distinct spot on the dorsal margin just beyond the lower spot at end of cell and more or less distinctly connected with it, a sharply angulated line in apical part of wing, the costal end of which ends in a costal spot beyond the end of cell; a zig-zag line along circum-apical margin; cilia gray, with scattered white and brown scales in basal portion, and three or four indistinct paler lines outwardly. Hindwings under 1, gray, dusted with fuscous, rather pointed; cilia nearly 1, gray, with pale basal line. Underside of wings fuscous, especially the anterior. Abdomen grayish-fuscous. Legs densely dusted with dark brown; posterior tibiæ with oblique median band and apex and apices of tarsal joints whitish. Expanse 14.0–15.0 mm., 0.56–0.6 inch.

Hab.—Penn. (Hazleton); Central N. Y., June; Mass. (Cohasset), July.

A very distinct species, very closely resembling *H. chalcofrontella* in its markings, but differs by the white ground color of forewings, the deeper excision and larger cilia of male antennæ and the somewhat more pointed wings. Three specimens in my collection, my specimen was taken at electric light June, 1902, one specimen in the Nat. Mus. Coll.

12. **H. buscklella** n. sp. (Plate II, fig. 19.)—Palpi long, recurved, longer and more slender in the female than in the male, second joint of latter nearly twice the thickness of the terminal joint, and roughened beneath with brown scales; grayish-white, more or less densely—especially in the male—dusted with brown, less so on the upper

edge and apical portion of second and basal portion of third joint. Head grayish-white, speckled with brown scales, vertex fuscous in middle, face faintly tinged with yellow. Haustellum long and scaly at base in the male, apparently obsolete in the female. Basal joint of antennæ nearly twice as long than wide, grayish-white, speckled with brown, pecten long, pale gray, shaft pale fuscous-brown, rather deeply excised above the base in the male, tuft subtruncate, denticulate, cilia less than $\frac{1}{2}$. Thorax grayish-white, speckled with brown, more densely so on anterior part of patagia and on the disc; anterior margin grayish-ochreous, behind it on each side, is a patch of blackish scales. Forewings elongate, pointed, costa slightly retuse along middle two-fourths, slightly depressed towards the apex, dorsal margin evenly curved; ground color white, dusted with dark brown and ferruginous, the latter predominating in basal, the former in apical half of wing; the dusting condensed as follows; basal part of extreme costa dark brown, near the base is a subcostal, ferruginous cloud, and within it a fine, more or less interrupted, black line, a similar line above and another beneath the fold in basal third, dorsal portion of the latter, near the base, more densely dusted with brown; at about one-third of the costa is a dark ferruginous spot, from which precede an irregularly curved, pale ferruginous fascia which reaches the dorsal margin a little beyond one-third, externally it fades gradually into the ground color, while towards the base project several dentiform processes, in the fascia and above the fold is a bright ferruginous spot, and a little beyond and above a second one, a pale ferruginous line extends into the median space above the fold, immediately beyond the middle is an oblique dark brown costal spot, extending toward but not attaining the fold, below its dorsal extremity and below the fold is a dark line, beyond the costal spot are some blackish dots, two moderately large spots at end of cell, and besides these a rather large whitish-brown costal and dorsal spot, and between these an acutely angulated line; periapical margin with a row of subconfluent blackish spots; cilia grayish, with four or five ill-defined pale lines; underside fuscous-brown. Hindwings nearly as wide as the forewings, costa slightly retuse in apical half, outer half of dorsal margin evenly curved to apex, the latter obtuse; pale yellowish-fuscous, with a faint brassy tinge; cilia under 1, grayish, with darker lines in outer half, yellowish towards the base with pale basal line. Abdomen pale grayish-fuscous, anal bush grayish-white, segments edged with black posteriorly and fringed with grayish-white scales; ovipositor of female exerted, short. Underside of body silvery white, somewhat dusted with pale fuscous. Legs white, suffused, especially on the outer side with dark fuscous; hair-brush of posterior tibiæ grayish-white. Expansion 16.–0 mm., 0.66–0.8 inch.

Hab.—Md. (Plummer's Island), July and August, 1903.

Six males and one female in the Nat. Mus. Coll., collected by Mr. Augst Busck, and to whom it gives me pleasure to dedicate this very interesting addition to our fauna.

The above description as far as coloration of wings concerns was taken from a male. The female, which appears to be somewhat rubbed, presents an almost altogether different appearance, with scarcely a trace of ferruginous coloring; a suffused grayish-fuscous, a trifle darker along both margins and apical portion; a fine more or less interrupted black line in the fold, edged above by whitish scales, some short, blackish lines in basal third near each margin; no evidence of a fascia, the discal spots of the male are replaced by some irregular blackish dots; spots at end of cell distinct. Hindwings darker, with very little lustre. Both wings are relatively wider than in the male, it expands 20.0 mm.

The coloration and pattern of marking of the forewing in the ♂♂. appears to be variable in intensity and extent. Vein 3 + 4 of hindwing connate or very short stemmed, in one wing at least, separate; vein 5 free in all.

13. **H. sciaphilella** Zell.

Dr. Zeller describes this species as follows:

"Alis ant cinereis, area basali postice abrupta macsulaque costæ triangula interins albido—marginata nigricantibus, pari punctorum supra angulum internum nigra. ♂."

"Head and thorax gray, somewhat shining. Antennæ gray, excised above the basal joint, excision with obliquely truncated scale tuft. Palpi as long as the thorax, slender, ascending, the second joint closely scaled, grayish-fuscous, white at the apex, terminal joint half the length of the second, pale at apex. Thorax beneath white. Legs fuscous, apices of tibiæ and tarsi whitish; posterior tibiæ compressed, both edges with fuscous hairs, apices and a white oblique spot about the middle externally, white, spines white. Abdomen short, gray, anal bush whitish. Forewings three and one-half lines long, rather narrow, of about equal width to tornus. Ground color pale gray, thinly dusted with blackish scales, basal fifth blackish, terminating in a straight, though not sharply defined line, before the middle is a large triangular costal spot, sharply defined and edged with white towards the base, attaining the fold, ill-defined externally, opposite to this is an ill-defined dorsal spot, forming thus an angulated though interrupted fascia, the angle resting upon the fold and the fascia becoming narrower towards

the dorsal margin and margined with white in its costal portion; two dark spots at end of cell and a nebulous spot on dorsal margin beneath; cilia gray. Hindwings narrower than the forewings, not acutely pointed; cilia gray with yellowish tint, with yellowish basal line."

Identical with *H. triangularisella* Ch. Have examined both types in the Cambridge Museum, and there is no doubt about their identity. Zeller's type came from Texas, while Chambers' came from Kentucky. The latter is an unspread specimen, type label 1550 in Chambers' handwriting. The wings of the left side are wanting.

Zeller's type of *sciaphilella*, a male in good condition, presents a peculiar dimorphism of the two hind wings, left hindwing eight veins, 3 + 4 short stemmed, 5 connate with stem, right hindwing seven veins—*Blastobasis*, this then very readily explains the confusion hitherto existing as to the position of this species. According to the law that the presence of a quality is dominant over its absence; or, that a retrogression or retarded condition is recessive to the more developed condition, enforces the reception of this species into the genus *Holcocera*.

The type bears the green label in Zeller's handwriting, number 1713, Texas, Dallas, Boll.

I add the following notes to the original description:

Palpi long, terminal joint slender, three-fourths the length of the second, the latter fuscous within and without, apex white, the terminal joint sprinkled with fuscous scales. Front grayish-white with some lustre, vertex fuscous. Basal joint of antennæ one-half longer than wide, white, dusted with fuscous, pecten long, fuscous; shaft of antennæ fuscous above, paler beneath, excised above the base, tuft within the excision truncate, scarcely pubescent. Thorax grayish-white suffused with fuscous, particularly on the disc, with some faint lustre. Forewings moderately wide, not acutely pointed; ground color pale grayish-white, speckled and marked with fuscous-brown, having a purplish lustre, as follows: Base, limited externally by a nearly straight line, followed by a white fascia, narrowed almost to a point on the costa and angulated externally, summit of angle in the fold, shaded in costal portion by a very pronounced nearly triangular patch, which becomes effaced outwardly; a much less pronounced opposite dorsal patch; no spots in middle space, two spots at end of cell, a pronounced patch on dorsal margin below end of cell, and a larger but less distinct one a little beyond the end of cell, on costal margin;

between these two latter is an ill-defined curved fascia in apical part; cilia pale gray, speckled with fuscous scales in basal portion. Hindwings nearly 1, costa retuse in apical third, grayish-white, dusted with fuscous; cilia grayish-white, 1. Abdomen grayish-fuscous, anal bush grayish-white. Underside of body yellowish-white, with some sheen. Legs white, shining, suffused with fuscous externally, tibiæ at each end and median band and apices of tarsal joints whitish.

14. **H. plagiatella** n. sp. (Plate III, fig. 20.).—Head and basal joint of autennæ sordid white, speckled and dusted with fuscous. Palpi long and slender, reaching considerably above the head, dirty white, speckled with fuscous, especially the second joint without, except its extreme apex, terminal joint about three-fourths the length of the preceding one. Shaft of antennæ pale fuscous, deeply excised above basal joint with scale tuft, cilia extremely short. Thorax sordid white, rather densely dusted with fuscous; patagia pale, fuscous anteriorly. Forewings rather narrow, pointed, costa slightly retuse along middle two-fourths; a large quadrate basal spot extending from costa to fold, fuscous, another rather large spot at two-fifths between costa and fold, but attaining neither, a few small spots of fuscous scales on the dorsal margin before the middle, two inconspicuous spots at end of cell; remainder of surface lightly dusted with fuscous scales, which become more condensed in apical part of wing, especially along the dorsal margin; cilia gray. Hindwings 1, grayish white, dusted with fuscous and with considerable lustre; cilia nearly 1, gray with pale basal line. Abdomen grayish, last five segments with a chocolate-brown transverse band; anal bush gray, underside of body silvery gray, dusted with fuscous. Legs grayish-fuscous; posterior tibiæ with a spot near the base, oblique median band and apices white. Expansion 17.5 mm., 0.7 inch.

Hab.—Arizona.

A single male specimen, not in first-class condition, in my collection. Easily recognized by its peculiar wing markings and the almost simple antennæ of the male, the cilia being sparse and short.

15. **H. livorella** Zell.—"Alis ant. angustis, osseo-griseis, puncto parvo infra basim costalem, majore disci ante medium parique punctorum venæ transversae nigris; post, minus longe acuminatis. ♂."

This is the author's short Latin diagnosis. His description in German I translate in partim as follows:

Anterior part of body, as well as the slender elongated basal joint of the antennæ and the scale tuft in the excision above it, dirty bone-yellow, dusted with gray, the face somewhat whitish; shaft of antennæ

thin, setiform, gray. Palpi very pale, as long as the thorax, curved upwards, slender, gradually pointed; third joint about one-half the length of the second. Legs concolorous with the thorax, only the anterior somewhat fuscous anteriorly; posterior tibiæ slender, feebly hairy above; feet not spotted. Abdomen short, blackish-gray, anal bush paler. Forewings three lines long, narrow, not widened, somewhat rounded at its narrowest end, same color as the thorax. Very near the base of the costal margin is a small, not very conspicuous blackish spot, a much larger and conspicuous spot in the median space before the middle, nearer the fold than the costal margin, a pair of blackish spots at end of cell, close together, above these is a short, not very distinct, dark line. Cilia pale gray. Hindwings to the middle, but little narrower than the forewings thence gradually narrowed to a distinct, though not elongated point, very pale gray, with some lustre, paler towards the base. Cilia pale yellowish. Underside of forewings unicolorous, gray; dorsal margin paler. Hindwings same color as upper side, somewhat darker along the costal margin.

Hab.—Texas.

Two males in Cambridge Museum labeled *livorella*, but not in Zeller's handwriting, Dallas, Tex. Boll. Zeller states (palpi): "third joint one-half the length of the second," whereas it is nearly as long. Antennæ deeply excised above the base, excision with truncated tuft, cilia short. The forewings can hardly be called narrow, costa somewhat arched from the base, white, lightly dusted with fuscous, the latter more condensed in basal portion with an ill-defined dash above the fold. The subcostal spot near the base, mentioned in the description is not noticeable, unless it is the supraplical dash mentioned here; beyond the darker basal dusting is a relatively wide irregular fascia, shaded externally, especially in costal portion by some dusting. Hindwing as wide as the forewing, pointed; cilia under 1. Abdominal segments light fuscous, fringed with silvery white scales, anal bush white. Veins 3+4 of hindwing stemmed, 5 out of stem (in one wing apparently free).

16. **H. iceryæella** Riley. (Plate III, fig. 21.)—Palpi long, recurved, second joint thickened towards the apex, terminal slender, pointed, much shorter than the preceding joint; grayish-white sprinkled with fuscous, apex of second, and base and apex of third, paler. Head and basal portion of antennæ sordid white, basal joint broad, pecten setaceous, shaft grayish-fuscous outwardly, excised above basal joint

in the male. Thorax grayish-white, more or less dusted with fuscous. Forewings moderately wide, costa slightly retuse beyond the middle, acutely pointed; ground color white, more or less densely dusted with fuscous-brown, the dusting condensed into patches, so arranged as to leave an oblique fascia of the ground color, commencing at the costa at one-third and extending to the dorsal margin at two-fifths; before this fascia is a large nebulous patch on the dorsal margin, enclosing—sometimes—a large white spot resting on the margin, the costal portion of the fascia is heavily shaded without, before the middle is a small discal spot and two others, distinct, at end of cell; beyond these are several small patches within the dorsal margin, and a row of spots along the base of the cilia, the latter grayish-white. Hindwings nearly as wide as the forewings, costa scarcely retuse, acutely pointed, silvery white, lightly dusted with fuscous; cilia 1. Abdomen sordid white, dusted with fuscous. Underside of body sordid white. Legs white, dusted with fuscous, ends of tibiæ and median band, as well as apices of tarsal joints, paler. Expansion 13.0–16.0 mm., 0.52–0.64 inch.

Hab.—Cal. (Pasadena, Alameda County, Los Angeles). Introduced from Australia. Larva lives on *Icerya* and *Leuconium* oleæ. This is the type of *Cynotes* Wlsh. Veins 3 + 4 of hindwing short stemmed or connate, 5 generally free or subconnate with stem of 3 + 4.

17. **H. maligemmella** Murtf.

This species, which at the time of its appearance, gave rise to the apprehension of becoming an orchard pest, is described by Miss Murtfeldt as follows:

"Alar expanse 14 to 15 mm. General color satiny brownish buff with slight opalescence, and more or less leaden shaded on thorax, wings and body. Head buff, densely and somewhat shaggily scaled. Eyes prominent, purple black. Antennæ two-thirds as long as wings; basal joint conspicuously long and stout; second joint also long, with the inner side peculiarly excavated. Palpi (labial) long, recurved with short, almost concealed basal joint, long slightly thickened second joint and slender, tapering terminal. Thorax broad; patagia rather large, all anteriorly bordered with leaden gray. Forewings varying in color from almost clear buff to buff so interspersed with the darker scales as to produce a 'smudged' effect; a small but distinct black discal dot and a group of five smaller, less clearly defined ones at the base of the terminal third, constitute the ornamentation. Hindwings rather broad, somewhat paler and more lustrous than the primaries. Fringes concolorous with wing surface, also varying in intensity of the

dark shadings. Body yellowish-gray with bright buff anal tuft. Legs agreeing in color with under surface, tibiæ, especially of hinder pair, densely clothed with long but appressed hairs."

Hab.—Missouri.

The larva, about 8 mm. long when full grown, is yellowish-green, head and dorsal part of first segment black, eats into the buds of both flowers and leaves of apple.

A cotype specimen in the Nat. Mus. Coll. scarcely agrees with the description, and still less with the figure as given by Miss Murtfeldt, the latter evidently had been reproduced from a photograph. This specimen presents a basal space, sharply limited externally by an angulated line, the summit of which is a little above the fold. This space is paler, uniformly grayish-fuscous; immediately beyond it and a little above the fold is a dark spot; remainder of wing mottled with fuscous, two spots at end of cell. It rather strongly resembles *Hol. modestella* Clem., but lacks the dark patch in the basal space.

Since the foregoing has been written I have been enabled through the courtesy of Prof. Alex. D. MacGillivray, of Cornell University, to examine the apparently unique type-specimen now the property of the above-mentioned institution. It is a male, faded and in poor condition, right forewing wanting, labial palpi ditto. Head ochreous. Antennæ moderately thick, excision above the basal joint not profound; cilia fully $\frac{1}{2}$. The "leaden-gay" border of anterior thoracic margin is rather purplish-brown, well marked, and rather behind the anterior margin, the latter being like the remainder of the thorax, ochreous. Forewings rather short and broad, very obtusely pointed, without paler basal space; sordid ochreous-gray, suffused with somewhat darker patches, discal spot small, though distinct; two spots at end of cell, the lower one larger, triangular, and distinct, in line with these two spots, equidistant, and above is another small spot, a trifle beyond these and within each margin is another small dot. These five spots are spoken of in the description as the base of the apical third, and are distinctly recognizable. Hindwings almost as wide as the forewings, grayish dusted

with fuscous and a pale yellowish tint, some lustre; cilia under 1. Abdomen ochreous-fuscous; anal bush grayish-ochreous. Underside of body and legs ochreous, dusted with fuscous. Expansion 14.0 mm., 0.56 inch.

The specimen has the following labels: "Type, *Holcocera maligeminella* Murt., *Nothris maligemmella* Murt.; Columbia Mo. 12, July 189; Stedman Coll."

Veins 3+4 of hindwing short stemmed, 5 subconnate with stem. The forewings of this species are more obtuse than in any other of our North American Blastobasidæ.

18. **H. gilbociliella** Clem.

Dr. Clemens describes this species very shortly as follows:

"Forewings pale yellow, with a dark dot in the middle of the wing, and slightly dusted with fuscous towards the apex. Hindwings pale ochreous-fuscous. Antennæ dark ochreous. Head and tibial palpi yellowish. The forewings of the female are more dusted with fuscous than those of the male."

The antennæ are thickened towards the base. In the male ciliate, cilia a trifle over $\frac{1}{2}$, excision not deep, scale tuft obliquely truncate. Labial palpi long and slender, terminal joint of nearly equal thickness, pointed, about three-fourths the length of second joint. Hindwings as wide as the forewings. Anal bush and legs pale yellowish or sordid white. Expansion 11.0–15.0 mm., 0.44–0.6 inch.

Hab.—Atlantic States.

The type, a male, in the Clemens' collection at the Acad. of Nat. Sciences, Philadelphia, in good condition. A female specimen in the Nat. Mus. Collection, three specimens in my own. The dark discal spot in middle of forewing is obsolete in some specimens. Might be confounded with *H. melanostriatella*, but aside from the black subcostal streak the antennæ are not excised in the male in the latter species.

19. **H. funebra** n. sp.—Palpi moderately robust, not reaching above the head, second joint dark fuscous-brown, somewhat thickened towards the apex, terminal joint attenuated towards the apex, two-thirds (♂) or three-fourths (♀) the length of the second, fuscous, speckled with whitish within. Antennæ of moderate thickness, fuscous-brown, with a faint sheen, slightly pubescent and denticulate within, not excised above the base in the male. Head and thorax fus-

cous, intermixed with grayish scales, with a faint greenish cupreous lustre. Forewings of moderate width, costa approximately straight for two-thirds its length, thence gradually depressed towards the obtusely pointed apex; ground color fuscous, suffused with brown and intermlxed with hair-.ike pale grayish scales, with a purple-brassy lustre in certain lights; the darker coler prevails, especially in costal and apical portion of wing, and along the dorsal margin; before the middle and a littfe above the fold is a dark, elongate spot, two others, larger and well marked at end of cell; cilia gray, sprinkled in basal half with fuscous and grayish scales. Hindwings as wide as the forewings, costal margin depressed from one-third its length, not acutely pointed, fuscous, especially towards the apex; cilia grayish-fuscous, a tifle over 1. Abdomen above fuscous, anal bush concolorous, underside of body grayish-fuscous. Legs grayish, more or less suffused with dark brown, tarsal joints slightly paler at apex. Underside of fore- and hindwings dark fuscous. Vein 5 of hindwing connate with stem of 3 + 4, the latter one-half the length of vein 4. Expansion 12.0–15.0 mm., 0.48–0.6 inch.

Hab.—Md. (Plummer's Island), Pa. (Hazleton).

Four specimens in the Nat. Mus. Coll. collected by Mr. A. Busck, May, June and July, 1903. A specimen, taken by the writer at light, is without the spots on the forewing. Not distinguishable from *H. purpurocomella* except by the male antennæ, which are not excised, very close to *inconspicua* Wlsh.

Var. **reductella.**

Two specimens in Mr. Kearfott's collection differ from the typical form as follows: Larger size 16.0 and 17.0 mm.; somewhat paler; front grayish-ochreous; head and thorax with scarcely any metallic lustre, the basal third of forewings appears, especially outwardly, a trifle paler; underside of body and legs much less suffused with dark fuscous. The wings relatively a trifle wider, and the hindwings more obtuse.

Hab.—Manitoba (Aweme).

The variability in the relative position of veins 3, 4 + 5 of the hindwings, find an apt illustration in these two specimens; one specimen has 3 + 4 scarcely stemmed and almost connate with 5; in the second specimen, on the right side, 3 + 4 short stemmed, 5 arising from the stem; left side, 3 + 4 longer stemmed, 5 connate with stem. To judge from the description this form seems closely related to *stygna* Wlsh.

20. **H. inconspicua** Wlsh.—"Antennæ pale grayish-brown. Palpi grayish-brown, darkened externally. Head and thorax grayish-brown. Forewings grayish-brown through a profuse dusting, amounting to an almost entire suffusion of this color upon a pale cinereous ground; the only marking indicated is a slight and obscure transverse shade at two-fifths from the base and a reduplicated brownish-fuscous spot at the end of the cell; cilia pale grayish-brown. Alar expanse 13–14 mm.

"Hindwings shining, purplish-gray; cilia yellowish-brown. Abdomen shining, brownish-gray. Legs pale yellowish-brown. Type in Mus. Walsingham."

Paratype, male, Nat. Mus. Coll.

Hab.—Shasta County (Hatchet Creek), California, July 14–17, 1871.

An obscure and ill-defined form. Have examined the specimen in Nat. Mus. Coll. Veins 3 + 4 of hindwing long stemmed, 5 out of stem of the latter, nearly unicolorous, the spots at end of cell as well as the obscure transverse shade, scarcely discernable. Appears to differ from *funebra* in the absence of the metallic sheen and first discal spot and the lighter simi-transparent color of the hindwings.

21. **H. stygna** Wlsh.—"Antennæ pectinate, but not notched; purplish-gray. Palpi purplish-gray. Head and thorax purplish-gray, the tegulæ with a distinct coppery tinge. Forewings tawny vinous gray, a purplish sheen strongly expressed at the base of the costa, the middle and outer half of the costa slightly darker than the remainder of the wing; the commencement of this dark shading extends across the wing to the dorsum, leaving the preceding space outwardly angulate at the middle, and a paler or more grayish shade; a reduplicated shade-spot at the outer end of the cell is very obscurely indicated; cilia brownish gray, with a slight tawny suffusion. Hindwings brownish-gray; cilia pale buff-brownish. Abdomen (missing). Legs brownish-gray, with broad tawny tarsal bands. Alar expanse 18 mm. Type, male, in the author's collection;"

Hab.—Mendocino County, north of Mendocino City, Calif. (close to the town), June 3–5, 1871. Unique.

The author compares this species with *H. purpurocomella* Clem. To judge from the description it should very closely resemble *Holcocera dives*, var. *basipallidella*; the basal space in *H. purpurocomella* is not paler and angulated externally.

22. **H. boreasella** n. sp. (Plate III, fig. 22.)—Palpi moderate, terminal joint one-half (♂) or three-fifths (♀) the length of the second; ochreous, suffused, especially externally with fuscous. Antennæ slender, grayish-fuscous, feebly denticulated beneath, not excised above the basal joint in the male; basal joint one and one-half as long as wide, ochreous, pecten gray. Head grayish-ochreous, finely speckled with fuscous. Thorax grayish-ochreous, suffused anteriorly and on the disc with purplish-fuscous. Forewings rather broad, especially in the male, costal margin nearly straight from about the basal third to apical fourth, equally narrowed from both margins to the rather acute apex; ground color sordid ochreous, streaked and somewhat diffused with purplish-fuscous, speckled with white scales, the latter forming a somewhat elongate triangular patch in the basal space, the latter limited at one-third by a strongly angulated line which is shaded outwardly, especially in costal portion, with dark purplish-fuscous, in this space, the white scales predominate, especially in the dorso-apical portion, and form a white line in the fold edged with fuscous scales, an indistinct short line of dark scales below the costa, immediately beyond the angle of the angulated line is a distinct, slightly elongate dark spot, and at the end of the cell two equally distinct spots, between the former and the lower spot at end of cell is a row of white scales edged with fuscous scales, and between this and the costal margin is a similar one, between the latter and the costal margin is a dark line which reaches the angulated fascia, a white line edged with fuscous in the fold, becoming less distinct outwardly, the suffusion with purplish-fuscous is more marked in costal half and apical part of wing, and more pronounced in the male, the white scales are more evident along outer portion of fold and in apical part of wing; cilia ochreous, sprinkled with white and a few fuscous scales. Hindwings as wide as the forewing, more obtusely pointed in the male, costal margin scarcely retuse, grayish with ochreous tinge and slightly dusted with fuscous; cilia 1, grayish-ochreous, abdomen ochreous-fuscous, anal bush ochreous. Underside of body and legs grayish-ochreous, suffused, especially the legs with fuscous. Expansion 18.0–19.0 mm., 0.72–0.76 inch.

Hab.—N. H. (Webster), Canada, (Montreal).

One male and four females in my collection. Very close to *nucella*, where comparative reference to this species will be made. Veins 3 + 4 of hindwing stemmed, stem variable in length, 5 out of stem, or connate with it; in one specimen free.

23. **H. nucella** Wlsh. (Plate III, fig. 23.)—"Antennæ brownish-fuscous; basal joint yellowish-brown. Palpi yellowish-brown, shaded with brownish-fuscous externally. Head and thorax yellowish-brown.

Forewings, male, yellowish-brown, more or less suffused with purplish-fuscous, especially along the costa and on the outer portion of the wing, an outwardly bowed transverse shade of the same indicated at one-third from the base; at the end of the cell is a reduplicated fuscous spot; cilia pale yellowish-brown; female, with the fuscous shading having a purplish tinge, and being very much thicker and more generally distributed than in the male (in some male specimens the suffusion is almost entirely absent), the basal third of the wing and a patch at the lower extremity of the cell alone exhibiting the paler ground color. Hindwings pale brownish-gray; cilia yellowish-brown. Abdomen and legs pale brownish-ochreous. Alar expanse 16–18 mm."

Hab.—Colorado, Loveland, 5000 feet, July and Sept., 1891; Denver.

The above is Lord Walsingham's description. Cotypes in the Nat. Mus. Coll. have been examined by the writer. This is the type of *Catacrypsis* Wlsh. The palpi are equal in both sexes. Hindwings as wide as the forewings, costal margin nearly straight, depressed towards the apex, the latter rather obtuse. Veins 3 + 4 of hindwing long stemmed, 5 from about the middle of the stem.

The peculiar ochreous-brown color distinguishes this species from any other of our North American forms except *boreasella*, from which it is distinguished by its smaller size and the absence of longitudinal lines and the patch of whitish scales in the basal space. From *H. nana* it differs at once by its much larger size.

24. **H. nana** n. sp. (Plate III, fig. 24.)—Head, basal joint of antennæ, thorax, and palpi pale ochreous-white, the latter long and slender, extending considerably above the front, terminal joint slender, nearly as long as the preceding, dusted externally, especially the terminal joint, with fuscous. Antennal shaft grayish, dusted with fuscous. Forewings rather narrow, costal margin slightly retuse about the middle third, pale ochreous, suffused in patches with fuscous having a faint purple lustre, as follows: a large, ill-defined oval patch in basal fifth, a triangular patch on both the costal and dorsal margins at one-fifth, curved outwardly and forming an ill-defined angulated fascia, on the inner margin of the costal spot, and above the middle is a well marked blackish spot, two similar spots at end of cell, a patch just beyond the middle of the costa and one at about four-fifths, a patch on the dorsal margin, just beyond the end of cell, a series of dashes along the base of the cilia, apical portion of wing more or less densely dusted with pale fuscous; a dark purple-brown spot at base of costa, extreme

costa of the same color ; cilia grayish-ochreous, sprinkled with fuscous scales, the latter forming two or three ill-defined lines. Hindwings as wide as the forewings in basal third, costal margin strongly retuse beyond the middle, apex pointed, grayish, dusted with fuscous ; cilia gray, over 1. Abdomen (wanting); underside of thorax and legs yellowish-white, dusted with fuscous, apices of tibiæ and tarsal joints pale.

Hab.—Texas (Brownsville). The type, probably female, in the Nat. Mus. Coll.

In coloration this species resembles somewhat *chalcofrontella*, but aside from size is of different wing shape, I place it here provisionally. Veins 3 + 4 of hindwing long stemmed, 5 out of stem of 3 + 4.

25. **H. elyella** n. sp. (Plate III, fig. 25).—Palpi white, more or less densely suffused with dark brown, except apex of second joint, long, and especially the terminal joint, slender, the latter about two-thirds the length of the second. Head sordid white, front smooth scaled, somewhat shining, vertex slightly rough. Basal joint of antennæ one-half longer than wide, sordid white, pecten of closeset scale like setæ, gives the joint a very broad appearance, shaft light fuscous, not excised above the basal joint, finely pubescent and denticulated beneath (male). Thorax sordid white, tinged with fuscous. Forewings relatively wide, costa slightly convex from the base, a trifle retuse about the middle, not acutely pointed at the apex, dull white, lightly dusted with fuscous, markings dark fuscous-brown, as follows : extreme costal margin, especially in basal half, two streaks in basal third, one about midway between the fold and dorsal margin, the other midway between fold and costal margin, above the latter streak and connected with it near the base is a small patch, extreme base, an irregularly quadrate costal patch at one-third and a larger dorsal patch opposite to it but extending almost beyond the middle of the wing length, and enclosing an obscure spot, a well marked dark spot before the middle and nearer the costa, two equally well marked spots at end of cell, in the median space are two longitudinal streaks, one nearer the costa, the other in a line with the lower spot at end of cell, just before the later but in the fold, is a short streak or patch and a nebulous dorsal spot just beyond it, dusting more condensed in outer half of wing, margin along base of cilia dark fuscous ; the latter light gray, speckled with white and fuscous scales. Hindwings as wide as the forewings, costa slightly retuse in outer half, obtusely pointed, grayish, dusted with fuscous ; cilia scarcely 1, grayish-white. Abdomen above fuscous ; anal bush grayish-white. Underside of body white, dusted with fuscous. Legs grayish-white, anterior and middle densely suffused, posterior dusted, with fuscous, ends of tibiæ and tarsal joints paler. Expanse 13.0–16.0 mm., 0.52–0.64 inch.

Hab.—Conn. (East River), Chas. R. Ely; Md. (Plummer's Island), A. Busck; Md. (Frederick); N. J. (Essex County), W. D. Kearfott.

Fifteen specimens in my own collection and two in the Nat. Mus. Coll.—all males—are before me. All were collected in July and August. Most of the specimens are more or less worn or rubbed, and in these the markings will fall short of the above description and the figure. It gives me pleasure to name this very distinct species after Mr. Charles R. Ely, of Washington, D. C., who collected all my Connecticut material, and to whom I consider myself under great obligation for this and much other material. In thirty hindwings examined vein 5 was free in six, in these the stem of 3 + 4 was short, among the remaining 5 was connate with the stem, or in a few instances arose from the latter near its origin.

26. **H. insulatella** n. sp. (Plate III, fig. 26).—Palpi, head, basal joint of antennæ and thorax sordid white, lightly dusted with pale fuscous. Palpi rather short and stout, the second joint more densely dusted externally, nearly twice the length of the terminal joint, the latter acutely pointed, scarcely dusted at all. Basal joint of antennæ nearly twice as long as wide, feebly curved, pecten of long, not closely set setæ, stalk slender, simple, grayish-fuscous, scarcely pubescent (♂). Posterior margin of head more distinctly whitish. Thorax anteriorly, except the patagia, infuscate. Forewings elongate, acutely pointed, costa approximately straight from the base to the apical fourth; ground color white, lightly suffused with dark fuscous, the latter prevailing more in the costal and apical portions of the wing, at one-third from the base is a heavy costal spot extending somewhat backward, then sends a narrower line obliquely backward, a spot less distinct but similar to the costal one, but a little nearer the base, on the dorsal margin, extending slightly backward and from which proceeds a narrow curved line which with the line from the costal spot forms an acute angulated fascia, the summit of the angle is a little nearer the costa than the dorsal margin, and which, viewed from the base resembles somewhat the letter W, at the end of the cell are two large, dark fuscous spots, and between the lower one of these and the angle of the fascia is a series of four or five unequal spots, the elongate oval space, enclosed between these and the rather densely speckled subcostal space, is almost white; cilia sordid grayish-white. Hindwings as wide as the forewings, costa not retuse, depressed towards the apex, latter acute, grayish-white, lightly dusted with fuscous externally;

cilia over 1; grayish, tinged with pale yellowish towards the base. Abdomen above and beneath and anal bush yellowish-white, basal half of segments above brown. Underside of thorax silvery white. Legs white, more or less densely dusted with fuscous. Expanse 17.0 mm., 0.68 inch.

Hab.—Col. (Glenwood Springs), in August.

Two males in my collection.

The peculiar insulated space on the forewing distinguishes this species from any other known to the writer. Vein 5 of hindwing connate with stem of 3 + 4, latter variable in length.

27. **H. inclusa** n. sp. (Plate III, fig. 27.)—Palpi recurved, grayish-fuscous, the second joint somewhat incrassate towards the apex and roughened beneath with scales, upper half of inner surface whitish, third joint slender, acutely pointed, three-fourths the length of the former. Head one-half as wide as the thorax, grayish-fuscous, smooth scaled, the scales tipped with grayish-white. Antennæ slender, fuscous above, gray beneath, basal joint one-half longer than wide, pecten setaceous, as long as width of joint. Thorax fuscous with a grayish sheen. Forewings moderately wide, pointed, ground color whitish, finely speckled with dark fuscous and heavily overlaid in its outer two-thirds of costal portion with dark fuscous-brown, basal space limited externally by a very conspicuous, evenly curved fascia, of the same color, shading off gradually outwardly, this fascia begins at one-third of costal margin and ends at one-fourth of dorsum; basal portion of wing rather densely dusted with dark fuscous; immediately beyond the fascia and connected with it are two longitudinal spots, one above, the other beneath the fold, two distinct spots at end of cell, beyond these the wing is rather densely dusted and speckled with fuscous; cilia gray, dusted in basal portion with white and fuscous scales. Hindwings under 1, gradually narrowed from the base, obtusely pointed, costa retuse in outer half, gray, dusted with fuscous, especially along the margins. Abdomen above grayish fuscous, with some lustre, anal bush grayish-ochreous; beneath, dark fuscous in basal portions, gray toward the extremity. Underside of thorax dark fuscous-brown. Legs grayish, densely dusted, especially the anterior and middle with dark fuscous. Expanse 15.0 mm., 0.6 inch.

Hab.—Pa. (Hazleton).

A unique male, in excellent condition, taken July 20, 1904, at light. Might be confounded with *modestella*, but its appearance is different, and the antennæ are not excised above the base. The second palpal joint is considerably roughened, almost like in *Gelechia*. Veins 3 + 4 very short stemmed, vein 5 narrowly separate from stem of 3 + 4.

28. **H. simulella** n. sp. (Plate III, fig. 28.)—Palpi of moderate length and thickness, terminal joint two-thirds (male) or three-fourths the length (female), of the second; white, densely suffused with dark fuscous-brown externally, speckled with fuscous within, apex of second joint white. Head, thorax and basal joint of antennæ white, speckled with fuscous scales. Shaft of antennæ slender, brownish, paler beneath. Forewings rather narrow, costa nearly straight from the base, apex pointed; ground color white, sparsely (male) or densely (female) speckled with dark brown scales; markings pronounced, dark purple-brown, as follows; a well marked spot below the costa and very near the base, an irregular, not sharply defined, and outwardly angulated fascia, the costal portion commences at one-third, extends obliquely outward towards the fold, along which it forms a streak, the dorsal part is subquadrangular and begins at one-fourth from the base, in the basal space are two dashes, one immediately above and the other a little nearer the base, and immediately below the fold, just beyond the middle, and a trifle nearer the costal margin is a small, inconspicuous spot, and at the end of the cell two very distinct spots, midway between the discal spot and the costal margin is a blackish line which extends as far as the end of the cell, another similar line immediately below the costal margin, well marked nebulous patches in apical part of wing, giving somewhat the appearance of an outwardly convex fascia; cilia pale yellowish-gray, basal half sprinkled with fuscous scales, interspersed with white. Hindwings as wide as the forewings, not acutely pointed, costa retuse in outer half; pale gray, dusted with fuscous; cilia 1, grayish, paler towards the base with pale basal line. Abdomen above white, lightly dusted with fuscous, anal bush grayish. Underside of body and legs white, the former lightly suffused with fuscous, the latter speckled with dark brown scales, leaving a median oblique spot on posterior tibiæ externally and apices of tarsal joints white. Expanse 16.0 mm., 0.64 inch.

Hab.—Arizona (Williams), Texas (Fedora).

Two specimens in the Nat. Mus. Coll., and a male in my own. The latter has but one forewing left, the ground color is white with scarcely any sprinkling of dark scales, the markings less pronounced than in the female. A female specimen in my collection from Stockton, Utah, collected by Mr. T. Spalding, has the wings narrower, and the forewings are more densely sprinkled with dark fuscous scales, I refer it doubtfully to the species under consideration.

29. **H. messelinella** n. sp. (Plate III, fig. 29.)—Palpi of but moderate length, sordid white, the second joint incrassate towards the apex and roughened beneath with scales, dusted externally with fuscous, terminal joint scarcely more than half the length of preceding

one (♂), not thicker at base than at the middle, pointed, thickly dusted with fuscous, except at base and extreme apex. Antennæ of moderate thickness, not excised above basal joint, latter pale yellowish; pale fuscous above, grayish beneath, obscurely denticulate and pubescent beneath. Head sordid white, speckled with fuscous scales and without lustre. Thorax sordid white, broadly margined in its entire width anteriorly with deep purple-brown. Forewings moderately wide, costa approximately straight three-fourths its length; ground color gray, sprinkled with whitish scales, the latter more aggregated in the basal third which is limited externally by a sharply angulated line, the summit of the angle much nearer the costa than the dorsal margin and limited by a distinct black spot; besides the white there are dark fuscous scales forming spots or patches, distributed as follows: a patch at base of costa, a distinct but not sharply defined spot at one-third, and a very feeble one about middle of costa, in the basal space immediately above the fold is a longitudinal dash, and immediately beneath it, but a trifle nearer the base another, and beyond it, in the fold and beginning on the angulated line another dash, on the disk are some scattered fuscous dots and dashes, two spots at end of cell; an outwardly angulated, not well defined fascia in apical part of wing, a series of dashes along base of cilia. Cilia grayish, spinkled with fuscous scales. Underside fuscous. Hindwings as wide as forewing, costa nearly straight, slightly retuse before the somewhat obtuse apex, grayish fuscous; cilia gray with pale basal line. Abdomen above grayish-fuscous, segments fringed posteriorly with sordid white scales; anal bush sordid white. Thorax beneath fuscous, abdomen ochreous, infuscated on the sides. Legs grayish, thickly dusted with fuscous, except ends of posterior tibiæ and ends of tarsal joints. Expanse 15.0 mm., 0.6 inch.

Hab.—Md. (Frederick), Fla. (Hastings).

Two male specimens in good conditions in my collection. The following variety may prove a distinct species, but prefer to leave it here for the present.

Var. **spoliatella.**

Six specimens in my collection very closely resemble the above, but differ, by all the markings being less distinct, especially so the basal streaks, a greater gloss of forewings, the latter paler, absence of the dark purple color of anterior thoracic margin, and longer and more slender palpi. Expanse 12.0–13.0 mm., 0.48–0.52 inch.

Hab.—Penna. (Hazleton), N. J. (Caldwell); two specimens of the latter locality were collected by and received from Mr. W. D. Kearfott.

30. **H. morrisoni** Wlsh.—"Antennæ with moderate pecten; pale brownish-ochreous. Palpi brownish-ochreous. Head and thorax grayish-brown, with paler speckling. Forewings rather narrow, elongate, not widening outwardly; base white, with grayish-brown suffusion, especially around the margins; a brownish shade at the base of the costa, a darker streak in the basal third of the fold, diffused and diluted to the flexus; beneath it a triangular brownish-fuscous dorsal patch arising a little before the middle, directed obliquely outward and ending obtusely on the cell at about one-half the wing length; beyond it a pair of brownish-fuscous spots at the end of the cell, and a few ill-defined similar spots around the apex and termen; cilia grayish-brown. Hindwings shining, pale brownish-gray; cilia pale brownish-ochreous. Abdomen and legs pale brownish-ochreous. Alar expanse 17 mm."

Hab.—Arizona. *Type.*—Male, Mus. Walsingham.

"A narrow winged species, differing much in appearance from any already described (Walsingham), and quite unlike such exponents of allied genera as I have before me."

The above is Lord Walsingham's description with comments. I have nothing to add; unknown to me. The peculiar dorsal patch should lead to the recognition of this species.

31. **H. fluxella** Zell.

Described as follows:

"Minuta, antennis crassiuseulis, supra articulum basalem squamis ampliatum, non excisis; alis aut cinereis, striga ante mediam fracta, albida, exterius nigricanti—marginata, puncta disci punctisque duabus geminatis veuæ transversæ coalescentibus nigris; posticis lanceolatis.

"Agrees nearly with *H. fractilinea* in markings, but is smaller with narrow hindwings and more slender abdomen, the antennæ, however, are not excised at the base. Palpi more slender than by *fractilinea*, bend upwards, as long as the thorax, light gray dusted with fuscous externally, third joint less than one-half the length of the second, more slender and pointed. Legs pale ochreous-white; posterior tibiæ rough haired, hind tarsi pale fuscous externally, joints pale at apex. Abdomen slender, sides of posterior segments with pale yellowish hairs, anal bush of same color. Forewings two and one-half lines long, gray, darker along the margins; transverse line angulated above the fold, margined externally with dark fuscous, before it and in the fold is a small black dot, and beneath it a short dark line, and behind it, immediately above the angle, is a sharply defined black spot; two confluent spots at end of cell, and beneath these a spot on the posterior margin; a line of non-confluent black spots at base of cilia. Hindwings about one-half the width of forewings, lanceolate, sharply pointed with distinct anal angle. ♂. Texas."

The type, numbered 1711, is in the Cambridge Museum. It bears Zeller's green label and name in his own handwriting—*Blastobasis fluxella* Z., Dallas, Texas, Boll.

The third palpal joint is certainly more than one-half the length of the second; palpi not very slender and divergent. Basal joint of antennæ broad, not longer than wide; pecten shorter than width of joint. Head and thorax sordid grayish-white, the latter purplish-brown anteriorly, this color extending across the patagia to base of costa of forewings, the latter moderately wide, not acutely pointed, base fuscous, the black dot in basal portion of fold is not evident; the angulated fascia is nearly at two-fifths the wing length, beyond the fascia, the wing is more densely dusted with fuscous, just beyond the spots at end of cell is a somewhat conspicuous costal and dorsal spot; cilia grayish-white with scattered white scales. Hindwings nearly as wide as the forewings, in basal portion, strongly narrowed towards the apex, the latter pointed; cilia a trifle over 1. Veins 3 + 4 long stemmed, 5 connate with stem. In a specimen in Lord Walsingham's collection vein 5 of hindwing arises out of stem of 3 + 4, but as elsewhere stated, this is a variable condition and of no diagnostic value.

32. **H. clemensella** Ch.

Relative to this species Mr. Chambers expresses himself as follows:

"*H. chalcofrontella* Clem. is so variable a species that it is possible this may be a variety of it; but it is not one of the described varieties.

"Whitish, dusted lightly with dark purplish-brown, the dusting dense on the second joint of the palpi. There is a purplish-brown patch at the base of the costa, a small one about the middle of the costa, a small one opposite to it on the fold, a small one on the disc opposite the space beween the other two and at the end of the disc, and a row of small dots around the apex at the base of the cilia. Alar expanse one-half inch. Season, August."

I have carefully examined the type in the Cambridge Museum, and have no hesitancy in pronouncing this species absolutely distinct from *chalcofrontella* and its varieties. The specimen, a male, is unspread, wings of left side wanting, markings of right forewing difficult to discern on account of

oiliness. The following notes taken may assist in the recognition of this species :

Palpi sordid white, rather stout, scarcely reaching to the lower border of the insertion of the antennæ, apex of second joint pale. Head sordid white, with some sheen, smooth scaled, finely speckled with pale fuscous. Basal joint of antennæ sordid white, rather broad, one-half longer than wide, pecten setaceous intermixed with some scales, stalk grayish-fuscous, not excised above the base, simple, moderately robust, neither ciliate nor pubescent. Thorax sordid white, and like the head, speckled with pale fuscous, Forewings elongate—more than in *chalcofrontella*, white, evidently dusted with fuscous, basal part of costa dark purple-brown, at one-fifth, there is a transverse costal spot reaching to the fold, but more distinct on the costa; apparently, there is an outwardly convex, rather wide fascia at one-third, but whether entire or not could not be determined, wider at the dorsal margin and equidistant from the base at both margins, just before the middle and nearer the costal margin is an elongate spot, two smaller dots at end of cell; cilia grayish, speckled with white and fuscous scales, a dark line along the periapical margin but separated from it by a pale line. Anal brush pale ochreous. Underside of body and legs grayish-white, the latter suffused with fuscous; end of tibiæ and tarsal joints paler. Venation not determinable.

The specimen bears Chambers' label, "*Clemensella*; Kentucky, Chambers."

33. **H. irenica** Wlsh.—"Antennæ, female, brownish-gray; basal joint with strong pecten, paler. Palpi grayish-white, median joint grayish-brown externally nearly to the apex; terminal joint also sprinkled with brownish-gray. Forewings grayish-white, with brown-gray sprinkling, especially on the outer two-thirds of the costa and on the dorsal and apical portions of the wing; a patch of this at the base of the costa, mixed with some ferruginous scales; a similar patch before the middle of the costa exhibiting more of the ferruginous coloring, which is diffused downward to the fold, touching the inner extremity of an elongate-ovate blackish-brown discal spot, beyond which, at the end of the cell, are two smaller spots of the same color, which is also faintly reproduced in a diffused patch or cloud on the dorsum beneath them and on the costa beyond them; cilia hoary grayish. Hindwings shining, yellowish-gray, with pale brownish-ochreous cilia. Abdomen whitish-gray. Legs whitish, shaded with brownish-gray on their outer sides Alar expanse 20 mm."

Type.—Female, Mus. Walsingham.

Hab.—Mendocino County, mouth of Albian River, California, May 30–31, 1871; British Columbia, New Westminster, June 13, 1900."

The author makes no further comment. A specimen in my possession from the Hulst collection and received from Prof. John B. Smith, agrees fairly well with the above description. Locality, Washington territory.

34. **H. illibella** n. sp. (Plate III, fig. 30.)—Palpi of moderate thickness and rather short, scarcely attaining to middle of front, gray, more or less densely overlaid with fuscous scales, especially on second joint, extreme apex of second and terminal joint whitish, the latter short, scarcely one-third the length of the second (♂). Antennæ moderately thick, gray, basal joint broad and short, pecten of close-set setæ, shaft dusted with fuscous, especially towards the apex. Head and thorax gray, finely speckled with pale fuscous scales, without lustre. Forewings elongate, of nearly equal width for three-fourths their length, margins approximately straight for the same length and equally narrowed to the apex; ground color gray, more or less densely overlaid with white scales intermixed with fuscous, giving the appearance of gray, the fuscous predominating along the margins, a small dark fuscous spot before the middle and above the fold, an ill-defined spot at two-fifths of costa, two spots at end of cell and above and beneath these, on the respective margins, is an ill-defined nebulous spot, a series of dark dashes along the base of the cilia, more marked along costal border; cilia gray, speckled with whitish and fuscous scales. Hindwings under 1, evenly narrowed from about the middle to the acute apex, pale gray, dusted with pale fuscous; cilia gray. Abdomen fuscous, segments edged with grayish-white scales posteriorly; anal bush ochreous-fuscous. Underside of body and legs grayish-white, more or less speckled or suffused with fuscous. Expanse 12.0–13.0 mm., 0.48–0.52 inch.

Hab.—Md. (Frederick). Three males in my collection.

An obscurely marked form. In one specimen the spot in middle of forewing is wanting, in another the costal spot at two-fifths. The terminal joint of palpi is strikingly short. Veins 3+4 of hindwing long stemmed, 5 out of stem near its base.

35. **H. crescentella** n. sp. (Plate IV, fig. 31.)—Palpi of moderate length, terminal joint slender, acutely pointed, two-thirds the length of the second joint, white, sprinkled within and without with dark brown scales, leaving a rather broad ring at the apex of the second and of terminal joint white. Antennæ brownish-gray, paler beneath, basal joint nearly twice as long as wide, sordid white with long grayish pecten. Head and thorax sordid white. Forewings moderately elongate, acutely pointed, costa nearly straight from the base

for three-fourths its length. Ground color white, without lustre, speckled with dark brown scales and dots, at a little more than one-third from the base is a well-marked, outwardly curved dark fascia, bordered within by an about equally wide fascia of the ground color, within the latter the basal space is dotted with brown, an ill-defined spot at base of costa, immediately beyond the dark fascia and a trifle nearer the costa, is a dark spot, and at the end of the cell two others, between the former and the upper spot at the end of cell is a series of four or five more or less connected dots, forming a more or less interrupted curved line, with the convexity towards the costa; about the middle of the costa is a patch consisting of small dots and a similar though smaller and less distinct patch, a little beyond the end of the cell, a series of small dots at the base of the cilia, the latter gray, speckled with white and dark scales. Hindwings as wide as the forewings, costa scarcely retuse; gray, dusted with fuscous; cilia gray, a trifle over 1. Abdomen whitish, lightly dusted with fuscous. Underside of body and legs white, anterior and middle legs suffused with fuscous. Expanse 14.0 mm., 0.56 inch.

Hab.—Utah (Stockton).

A female specimen, collected by Mr. Tom Spalding in my collection. Vein 5 of hindwing connate with stem of 3 + 4.

Var. **annulipes.**

A specimen, female, from the Baboyquivaria Mountains, Ariz., in my collection, measuring 13.0 mm. agrees well with the type in markings, but differs by the hindwings having a brassy sheen and the cilia are more tinged with yellow. Legs white, tibiæ with two broad fuscous bands, leaving the ends and a band in the middle white, apices of tarsal joints conspicuously white, rest fuscous. Vein 5 of left hindwing connate with stem of 3 + 4, distinctly from the stem in right hindwing.

36. **H. spretella** n. sp. (Plate IV, fig. 32.)—Palpi, head, basal joint of antennæ and thorax grayish-white, tinged with ochreous. Palpi reaching to upper margin of the antennal insertion, terminal joint two-thirds the length of the second; speckled with fuscous scales, more densely without. Antennæ grayish-fuscous, not excised above the base, finely denticulate and shortly ciliate beneath in the male, a little more robust than in the female; basal joint rather small, pecten gray. Thorax and patagia suffused with fuscous anteriorly. Forewings rather elongate, costal margin approximately straight from base to apical fourth; ground color white, rather densely speckled with dark brown from basal third outwardly, the dark scales most pro-

nounced in costal part of wing, and least along the middle of the disc, on the costa near the base is a dark fuscous patch, from which extend a transverse spot to the fold, the remainder of the basal space is thinly speckled with pale fuscous, at one-third is a nearly straight fuscous fascia, rather broad but not sharply defined externally, within this fascia and on the fold is a darker spot, another more distinct spot immediately beyond the fascia and a little nearer the costa, another elongate spot beyond the middle and a little above the fold, at the end of the cell are two somewhat coalescent spots, from each of these a dark shade extends to respectively the costal and dorsal margins; cilia grayish-white. Hindwings about as wide as the forewings, acutely pointed, costa scarcely retuse outwardly, whitish, lightly dusted with fuscous, with some lustre; cilia a trifle over 1, pale gray with pale yellowish sheen. Abdomen grayish-fuscous, anal tuft ochreous. Underside of body silvery white, shining, abdomen suffused with fuscous. Legs white, anterior thickly suffused with fuscous, middle and posterior, especially the latter, much less so, oblique spot and apices of posterior tibiæ and apices of tarsal joints pale. Expanse 16.0–21.0 mm., 0.64–0.84 inch.

Hab.—Ariz. (Williams, Phœnix).

Four specimens, two males and two females, are before me. Three of these in the Nat. Mus. Coll. from Williams, Ariz., measure 16.0 mm., or a trifle over, while the fourth, a female from Phœnix, in my collection, measures 21.0 mm., but aside from its larger size and more pronounced markings, it does not differ. The transverse costal spot near the base and the two distinct spots in the mesial space, distinguish this species from any other. Stem of veins 3 + 4 of hindwing about half the length of vein 4, 5 connate with stem. A specimen from Vowell's Mill, La., and another from Alabama (without locality) in my collection, may belong here; their markings, however, are indistinct, and do not permit a definite opinion. Two other specimens from Williams, Ariz., also in the Nat. Mus. Coll. measure only 14.0 mm., and do not have the basal space paler as in the typical form.

37. **H. ursella** Wlsh.—"Antennæ with pecten, but without notch; pale brownish-ochreous. Palpi brownish-gray externally, dirty whitish on their inner sides. Head and thorax bone-whitish, the latter tinged brownish-gray anteriorly. Forewings bone-white, much suffused and sprinkled with brownish-gray, overclouding the costa as well as the

apical area beyond the cell, but less profusely along the dorsum and scarcely at all along the disc; a faintly indicated narrow brownish-gray fascia seems to leave the costa at one-third from the base, and, after interruption on the cell, is bent inward from the fold to the dorsum at one-fourth; this is somewhat accentuated in the fold, where it probably absorbs a small darker spot, corresponding to, but preceding a larger brownish-fuscous discal spot about the middle of the wing; two smaller darker spots are indicated at the end of the cell, and one at the lower edge of the cell equidistant between the inner and outer discal spots; the apex is slightly mottled, the cilia pale brownish-gray. Alar expanse, 18 mm. Hindwings pale gray, with a slight brownish tinge; cilia pale brownish-ochreous. Abdomen grayish. Legs pale brownish-ochreous."

Type.—Male, in the author's collection.

Hab.—Shasta County, Bear Creek, California, July 27–28, 1871.

The above is Lord Walsingham's description, from this and his reference to *inconspicua* we may infer that the general effect and appearance of this species is rather grayish-fuscous than sordid white.

38. **H. punctiferella** Clem. (Plate IV, fig. 33).—Labial palpi yellowish white, dusted externally with fuscous, apex of second and of terminal joint white, the latter two-thirds the length of the former. Head sordid white with yellowish tinge. Antennæ yellowish-brown, not excised above the basal joint (♂), the latter one-half longer than wide, pecten grayish-white. Thorax sordid gray, with a yellowish-brown tinge. Forewings rather narrow, costa approximately straight, apex acute; ground color whitish, dusted with brown, the dusting more condensed along the margins, especially the costal and in apical portion of the wing, a subquadrate dark brown costal spot at one-third, opposite this but a trifle nearer the base, is a larger, irregularly triangular patch, the apex of which extends beyond the fold, but does not reach the costal spot, within the dorsal spot is a plical dash, and behind it and obliquely above is a distinct, longitudinal spot before the middle, two distinct spots at end of cell and midway between the lower one of these and the discal spot is a distinct, longitudinal spot on the posterior median vein, a row of spots along the apical margin; cilia gray with some scattered white and brown scales. Hindwings a trifle under 1, costa scarcely retuse, apex pointed; gray, lightly dusted with fuscous, with yellowish tinge; cilia concolorous with pale basal line. Abdomen above, underside of body and legs grayish, dusted with fuscous, anal bush pale ochreous. Expanse 11.0–13.0 mm.

Hab.—Penna. (Hazleton); (Nicholson), collected by E.

Lister. Two specimens in my collection compared with the type in fairly good condition in the Academy of Natural Sciences, Philadelphia.

Dr. Clemens' description of this species is defective, as he does not mention the marginal spots at one-third of the wing length. He described it as a *Gelechia*. Vein 5 of hindwings connate with or narrowly separated at its origin from the stem of 3 + 4.

Var. (**Hypatima**) **subsenella**. Zell. (Plate IV, fig. 33*a*.)

The type, a male, is in the Cambridge Museum. It has Zeller's green label, 1716, Dallas, Tex., and name in his handwriting. Consider this form a variety of the above and from which it differs by the darker color of head, palpi and antennæ, a transverse costal spot very near the base, and the dorsal spot not extending beyond the fold. The last character may not be a constant one, and also the fact that the type specimen is minus the wings on the left side, a number of specimens in my collection, all taken in my locality agree with this form, except that in all of them the dorsal spot extends beyond the fold, thus agreeing with *punctiferella*, from which, however, it differs by its general darker coloration, the dark costal spot near the base, and its somewhat larger size—13.0–14.0 mm.—one out of a series of ten, sent to Lord Walsingham for determination, was returned as *Hypatima texanella* Wlsh. In five of these specimens vein 5 of forewing is distinctly free, in the others apparently connate with stem of 3 + 4.

Var. **texanella** Wlsh. (Plate IV, fig. 33*b*.)

Very close to the preceding variety, from which it differs by its somewhat lighter color and a tendency of the plical dash at one-third and the spot on the posterior margin of the cell to become obliterated. The fascia at one-third is less angulate. The author, in fact, does not mention these characters in the description, but in one wing—slide specimen—from a cotype in the National Museum Collection, which is before me, both are present, though not marked. Expanse 14.0–16.0 mm., 0.56–0.64 inch.

Hab.—Texas (Bosque County, Fedora); Utah (Stockton). Tom Spalding collectior; Colorado, Alabama.

In the hindwing of the above-mentioned slide specimen, vein 5 is distinctly free, in others connate with stem of 3 + 4.

39. **H. zelleriella** n. sp. (Plate IV, fig. 34.)

In "Annerkung 2" to his description of *Hypatima subsenella*, Zeller refers to two male specimens, which he compares with and doubtfully refers to the last named species. I have examined these specimens carefully, and entertain no doubt of their being distinct.

Palpi, head, basal joint of antennæ and thorax bony white. Third joint of palpi two-thirds the length of the second joint, the latter roughened with scales beneath, dusted with fuscous. Basal joint of antennæ scarcely longer than wide, pecten gray. Vertex and anterior part of thorax dusted with fuscous. Form of forewings like those of *subsenella*, ground color a sordid white with a yellowish tint, dusted lightly with fuscous; basal space limited externally by an interrupted, irregularly angulated line, a dark nebulous spot at base of costa, a dark line on the fold before and another crossing the angulated line, an ill-defined spot on both the costal and dorsal margins at one-third, first discal spot just beyond angle of line, somewhat elongated, two distinct spots at end of cell, and another elongated spot on the posterior margin of cell, a distinct and rather conspicuous patch on middle of costa, a nebulous spot on both margins just beyond the cell, and a row of dots along base of cilia; cilia gray, speckled with white and fuscous scales and two or three paler lines. Hindwings not as wide as forewings, costa retuse outer two-fifths, pointed, grayish-white, dusted with fuscous; cilia over 1; veins 3 + 4 stemmed, 5 free (in one wing vein 5 appears to be connate with stem 3 + 4). Expanse 14.0 mm., 0.56 inch.

Hab.—Texas (Dallas).

Types in Cambridge Museum. I name this species after the late Prof. P. C. Zeller in consideration of his valuable contributions to our knowledge of North American Microlepidoptera. The specimen which he refers under "Amerkung 1" to his *subsenella* belongs to *Valentinia*. In his reference—Amerkung 2—Zeller does not mention the spot on the middle of the costa, but mentions a dark line or streak near the base and within the dorsal margin, this character I could not discern in either of the specimens.

Var. **annectella**. (Plate IV, fig. 34*a*.)

Three specimens in my collection agree with the above very closely, except that they lack the conspicuous spot in middle of costa, and instead of the dash on the fold in basal space, a short dash above and beneath,

Hab.—Iowa (Iowa City), La. (Vowell's Mill).

40. **H. vestaliella** n. sp. (Plate IV, fig. 35.)—Palpi long, white, the second joint rather thick, tinged with yellowish above, the third joint two-thirds the length of the former, finely speckled with fuscous. Basal joint of antennæ and pecten white, former nearly twice as long as wide, shaft not excised above the base, pale yellowish-fuscous. Head white, face yellowish. Thorax white, with some lustre. Forewings narrow, pointed, costa approximately straight, white, very lightly and inconspicuouly dusted with pale brown here and there, scarcely clouding the ground color; markings dark brown, as follows: basal part of extreme costa, a subcostal spot near the base, a short streak in basal part of wing immediately beneath the fold, a streak in the fold beginning at one-third, an elongate spot obliquely above (first discal), a small spot at lower margin of cell at three-fifths of winglength, two spots at end of cell, a strongly angulated line in apical part of wing, commencing in a nebulous spot within the costal margin and a little beyond the cell and ending in a similar spot within the dorsal margin, a row of dots along periapical margin; at one-third of the winglength is a diffused, ill-defined costal and dorsal spot; cilia gray, sprinkled with white scales. Underside fuscous. Hindwings about as wide as the forewings, rather acutely pointed, costa slightly retuse in outer half; grayish-white, very slightly dusted with fuscous; cilia over 1, pale gray, yellowish towards the base. Abdomen above and beneath white, anterior portion of upper segments brown, anal bush yellowish-white. Underside of thorax and legs silvery white, tinged with reddish fuscous. Expanse 12.0–14.0 mm., 0.48–0.56 inch.

Hab.—Md. (Plummer's Island, June and July); Penna. (Hazleton, July); Mass. (Cohasset, July).

Four specimens from the Nat. Mus. Coll. and two in my own are before me. Conspicuous by its white color; markings variable in extent. In the Massachusetts specimen (Nat. Mus.) the marginal spots at one-third are pronounced, coalesce and form a fascia, while in others scarcely a trace of these spots is in evidence. A specimen from Brownsville, Tex., in the Nat. Mus. Coll. while seemingly agreeing in coloration, has decidedly narrower hindwings. Vein 5 of

hindwing arises from, is connate with or free from stem of 3 + 4.

Closely related to *punctiferella*, from which it differs by its rather conspicuous white color, narrower forewings and the black streak in basal space.

41. **H. tartarella** n. sp. (Plate IV, fig. 36.)—Labial palpi pale yellowish-white, dusted with dark fuscous externally, especially the terminal joint, leaving the base of the latter pale, innerside thinly dusted, second reaching to upper edge of antennal insertion, somewhat thickened towards the apex and slightly roughened along lower edge with fuscous scales, terminal joint pointed, two-thirds as long as the preceding joint. Head pale yellowish-white, somewhat rough scaled, more or less suffused with gray. Basal joint of antennæ yellowish-white or grayish, of moderate length and width, pecten of closeset bristly hairs, shaft grayish-fuscous, not excised above the base. Thorax grayish-white, speckled with pale fuscous. Forewings narrow, pointed, ground color white, overlaid with grayish-fuscous as to almost entirely conceal the ground color except in basal third, the latter limited externally by an acutely angulated line, the angle being nearer the costal margin; this space is less suffused with grayish-fuscous, the latter more marked along the margins and extreme base, and a less distinct patch in the middle along the fold, ending before angle of fascia in a more or less distinct spot. A dark semi-oval spot at costal end of the angulated line, and an ill-defined one at the dorsal end of same; just beyond the summit of the angulated line is a strongly marked dark and somewhat elongated spot, two equally well-marked spots at end of cell, and before the lower one of these, on the posterior margin of the cell, is a more or less elongated, very distinct spot, of the remainder of the wing, the darker coloring predominates more along the margins and in apical part of wing; cilia grayish-white, speckled in basal half with grayish-white scales. Hindwings nearly 1, costa scarcely retuse, dorsal margin feebly curved at tornus, not very acutely pointed at apex, grayish-white, suffused with pale fuscous; cilia grayish, over 1. Abdomen grayish-fuscous, anal bush gray. Underside of body and legs grayish-white, the latter more or less densely suffused with dark fuscous. Expanse 13.0–15.0 mm., 0.52–0.06 inch.

Hab.—Md. (Plummer's Island).

Nine specimens in the Nat. Mus. Coll., all collected by Mr. A. Busck at light. A sombre looking insect, markings vary variable in extent and intensity. Does not closely resemble any other form.

42. **H. pusilla** n. sp. (Plate IV, fig. 37.)—Palpi rather robust, scarcely reaching to the lower margin of the antennal insertion, fuscous, the second joint at apex and within paler, thickened towards the apex and somewhat roughened with scales beneath. Head grayish-fuscous, front smooth with a greenish sheen. Antennæ stout, light fuscous, with short pubescens beneath, not excised above basal joint, the latter grayish-ochreous, but a trifle longer than wide, pecten gray. Thorax grayish-fuscous, with some lustre, somewhat darker anteriorly. Forewings elongate, pointed; ground color gray with a faint ochreous tint, dusted with fuscous, costal part of base and extreme costal margin for one-half its length dark fuscous, a fuscous fascia at one-third, rather broad, curved and about equidistant from the base at both margins, first distal spot at outer margin of fascia and midway between costa and fold, distinct, a well-marked elongate spot on the posterior margin of the cell, spots at end of cell confluent, costal and apical portion of wing more densely dusted, especially so above and a little beyond the end of the cell, where it forms a nebulous patch, an elongate spot on the end of the veins, along the periapical margin; cilia gray, darker towards the base. Underside fuscous. Hindwiugs under 1, strongly narrowed towards the apex, latter not very acute; grayish-fuscous; costa nearly straight, scarcely retuse; cilia over 1, gray, yellowish towards the base. Abdomen grayish-fuscous, anal bush gray. Underside of body grayish-white with yellowish tint, some lustre. Legs yellowish-white, suffused with fuscous, median spot and apex of tibiæ and apices of tarsal joints paler. Expanse 10.0 mm., 0.4 inch.

Hab.—Texas (Brownsville).

A male specimen in my collection received some years ago from the late Prof. F. H. Snow. Much smaller than any of its near allies, with palpi and antennæ (male) decidedly robust. In size it comes near to *H. nana*, from the same locality, but is an altogether different species.

43. **H. rufopunctella** n. sp.—Palpi (wanting). Head, basal portion of antennæ, thorax and forewings white with some lustre. Basal joint of antennæ rather slender, twice as long as wide, pecten setaceous, pale gray, shaft pale fuscous gray with faint annulations, very slender (female). Forewings rather narrow, costa very slightly convex from the base, apex acutely pointed, very lightly dusted with ferruginous scales, a little more evident along the costa and in apical part of wing, an inconspicuous patch of such scales on the fold very close to the base, a short line on the fold at one-third, a rather conspicuous spot before the middle (first discal) and a little nearer the costa, two spots at end of cell which are connected by a transverse line, before the lower of these, on the posterior margin of cell is another less distinct spot; cilia whitish. Hindwings a little narrower than the

forewings, acutely pointed, costa not retuse, pale grayish-white with lustre, lightly dusted with pale fuscous externally. Abdomen above rufous, segments fringed with white scales. Underside of body silvery gray. Legs grayish-white, very lightly touched with reddish-brown. Expanse 16.5 mm., 0.66 inch.

Hab.—Col. (Denver), Oslar.

A single female specimen in my collection. Easily recognized by the white color of the insect and the rusty-red markings of the forewings and the same color of the abdomen above. Veins 3 + 4 of hindwing long stemmed, 5 from middle of stem.

p.44.

44. **H. melonostriatella** n. sp. (Plate IV, fig. 38.)—Palpi somewhat robust, of moderate length, sordid white, dusted with fuscous. Head, basal joint of antennæ and thorax white, speckled with pale brown scales. Basal joint of antennæ one-half longer than wide, pecten long, of closeset whitish setæ; shaft grayish-fuscous, shortly ciliate and denticulate beneath not excised above base (male). Forewings somewhat elongate, pointed, ground color whitish, dusted with pale reddish-brown; the dusting more marked along the margins, and especially so in apical part of wing, where it is intermixed with fuscous; a spot at extreme base of costa, costal margin for about one-third its length, a streak on basal portion of anterior median vein, extending somewhat along vein 11, a somewhat elongated spot before the middle and two spots at end of cell, of which the upper one is longer, dark blackish-brown; cilia pale gray, speckled with pale reddish-brown and whitish scales, with two or three pale lines. Costo-basal portion of underside of wing infuscate. Hindwings a trifle narrower than the forewings, costa retuse beyond one-third, apex rather acute, grayish-white, lightly touched with pale brown, especially along the margins; cilia a little over 1, pale gray with pale basal line. Basal portion of abdomen above ferruginous, remaining segments of same color, fringed with sordid white scales; anal bush sordid white. Underside of thorax silvery white, abdomen pale yellowish-white. Legs white, dusted with brown, the latter color arranged in undulating transverse lines on the anterior and middle femora, hind legs more grayish-white, hairs of tibiæ long. Expanse 14.5 mm., 0.58 inch.

Hab.—Pa. (Hazleton); Conn. (East River), Chas. E. Ely collector.

Seven specimens, all males, in my collection. Two specimens in my collection from Frederick, Md.—not in very good condition—probably belong here, but the streak on the anterior median vein is scarcely noticeable, and there is a black dot on the fold at one-third. In five of the hindwings examined vein 5 is distinctly free, while it is connate with

the stem of 3 + 4 in the remaining the conditions varying at times in the same specimen. From *H. gilbociliella* Clem., with which this species might be confounded, it is distinguished aside from structural differences of the male antennæ, by the dark subcostal streak near the base.

45. **H. interpunctella** n. sp. (Plate IV, fig. 39.)—Palpi slender, especially the terminal joint, the latter two-thirds (male) or three-fourths (female) the length of the second; white, dusted, especially the second joint, except at apex, with blackish scales. Head white, smooth scaled, with some lustre. Basal joint of antennæ white, nearly twice as long as wide, pecten setaceous, stalk slender, not excised above the base in the male, equal in both sexes, pale grayish-brown. Thorax white, smooth, lustrous. Forewings narrow, acutely pointed, costa approximately straight from the base for three-fourths its length, white, dusted with pale brown, more so in costal and apical portions of wing, this dusting does not conceal the ground color, no distinct markings, except a row of blackish dots, commencing about the middle of wing length, immediately above the anterior median vein and extending along vein 10, towards, but not attaining the costal margin, basal half of extreme costal margin fuscous, an indistinct elongate spot before the middle and two spots at end of cell, aside from these are some scattered blackish dots; cilia grayish with scattered white scales, Hindwings as wide as the forewings, costa nearly straight, but little depressed to the acute apex; pale gray, lightly dusted with pale fuscous; cilia gray, a little over 1. Abdomen above, underside of body and legs silvery white with lustre, the legs very lightly dusted with fuscous; anal bush white. Expanse 14.0 mm., 0.56 inch.

Hab.—Utah (Stockton), Tom Spalding collector.

Two males and one female in my collection, obscurely marked, except the row of dots above the anterior median vein, which appear to be constant, though variable in extent and distinctness. Veins 3 + 4 of hindwings short stemmed, vein 5 free, except in one hindwing, where it is connate with stem of 3 + 4.

EUBOLEPIA gen. n.

Type *anomalella.*

Palpi very long, slender, recurved, the terminal joint about three-fourths the length of the second, front fringed each side with pecten-like hairs; antennæ (♀) slender. Forewings moderately wide, widest near the base, gradually narrowed to the not very acute apex; a transverse ridge of raised scales near the base, and a tuft of similar scales before the middle; twelve veins, 7 + 8 long stemmed, remaining

veins free. Hindwings as wide as the forewings, costa scarcely retuse, rather obtusely pointed; cilia scarcely 1; eight veins, 3 + 4 stemmed, 5 out of stem of 3 + 4 near its base. Brush of posterior tibiæ not strongly marked.

Differs from *Holcocera* in the presence of scale ridge and tuft on the forewings, and the front fringed each side with hair-like scales, two characters not observed in any other genus of the family known to me. The type is a female. The male in all probability, when discovered, will have the antennæ excised above the basal joint. This latter character, together with the scale ridges of the forewing, would show a certain analogy to certain Phycitid genera. One species only.

1. **E. anomalella** n. sp. (Plate IV, fig. 40, 40*a*.)—Palpi light gray, speckled with brown, especially the second joint externally. Head smooth scaled, except posterior edge of occiput, which is somewhat rough haired, scales of front and vertex about equally mixed brown and pale gray, sides of front fringed with closeset pecten-like hairs of a grayish color. Antennæ fuscous, basal joint nearly twice as long as wide, pecten long, gray. Thorax fuscous-brown, intermixed with gray scales posteriorly. Ground color of forewings whitish, sprinkled with dark brown scales; extreme base of costa and a transverse dorsal spot very close to the base, blackish brown, at less than one-sixth the wing length is a strongly marked transverse ridge of dark brown scales with an æneous lustre, at about one-third is an oblique costal streak, slightly convex outwardly, which reaches the fold, where it joins a less distinct dorsal spot, just above the fold and on the streak is a fuft of dark brown scales with æneous lustre; beyond the fascia or streak the dark dusting is more pronounced, especially in the costal portion, two dark spots at end of cell, the lower one of these is a trifle nearer the base. Two obscure longitudinal streaks in median space, and an acutely angulated line in apical portion of wing, a row of irregular dots along base of cilia. Cilia gray, with about three pale lines, one near the middle, one near and the other along the outer margin. Underside grayish-fuscous. Hindwings gray, dusted with fuscous; cilia gray, with an obscure darker line before the middle. Underside pale grayish-fuscous. Abdomen grayish-brown, segments edged with white scales. Underside of body pale yellowish-white with some lustre. Ovipositor not exerted. Legs silvery white, the anterior rather densely dusted with fuscous, especially within, tibiæ at both ends and median fascia white, hind legs less densely dusted, except tarsi, leaving the apices of joints paler. Expanse 19.0 mm., 0.76 inch.

Hab.—Arizona (Pinal Mt.).

The type, a female, in the Nat. Mus. Coll. This peculiar species could not be mistaken for any other of this family.

LIST OF SPECIES AND BIBLIOGRAPHY.

BLASTORASIS Zell.

1. **guilandinæ** Busck, Proc. U. S. Nat. Mus. xxiii, 234, 1900.
2. **hulstella** n. sp.
3. **yuccæcolella** n. sp.
4. **plummerella** n. sp.
   " var. *fuscopurpurella.*
   " var. *simpliciella.*
5. **sagitella** n. sp.
6. **distinctella** n. sp.
7. **vilella** Busck, Journ. N. Y. Ent. Soc. viii, 239, 1901.

ZENODOCHIUM Wlsh.

1. **citricolella** Ch., Rept. U. S. Dept. Agric. for 1879, p. 207; Comstock Rept. U. S. Dept. Agric. for 1879, 1880, pp. 206–7; Hy. Edwards, Bull. U. S. Nat. Mus. No. 35, 1889, p. 125; Riley, Smith's List Lep. Bor. Am. 1891, p. 104, No. 5561.

   Blastobasis citriella Ch., Rept. U. S. Dept., Agr. for 1879, 1880. p. 245.
2. **coccivorella** Ch., Rept. U. S. Dept. Agr. for 1879, 1880, pp. 207, 245; Comstock, Rept. U. S. Dept. Agr. for 1879, 1880, p. 244; Packard, U. S. Dept. Agr. Rept. Ent. Comm., Bull. No. 7, 1881, p. 54; Douglass, Ent. Mo. Mag. xxiv, 1888, p. 228; Hy. Edwards, Bull. U. S. Nat. Mus. No. 35, 1889, p. 125; Packard, U. S. Dept. Agr. Rept. Ent. Comm. v, 1890, p. 219; Riley, Smith's List Lep. Bor. Am. 1891, p. 104, No. 5562.

VALENTINIA Wlsh.

1. **glandulella** Riley, Can. Ent. iii, 18, 1871; iv, 17, 38, 62, 65, 1872; Rept. Ins. Mo. iv, 144, 1871; Chambers, Cin. Quart. Ins. Sci. ii, 256, 1875; Walsingham, Proc. U. S. Nat. Mus. xxxiii, p. 201, 1907, Jr. Ent. Mo. Mag. xlv, p. 47, 1909.
2 **fractilinea** Zell., Verh. zool-bot. Ges. Wien. xxiii, 298, 1873; Proc. U. S. Nat. Mus. xxxiii, p. 202, 1907.
3. **quaintancella** n. sp.
4. **nothrotes** Wlsh., Proc. U. S. Nat. Mus. xxxiii, p. 202, 1907.
5. **retectella** Zell., Verh. zool.-bot. Ges. Wien. xxiii, p. 297, 1873.
6. **floridella** n. sp.
7. **confectella** Zell., Verh. zool.-bot. Ges. Wien. xxiii, 303, 1873.
8. **repartella** n. sp.

EURESIA gen. n.

1. **pulchella** n. sp.

CALOSIMA gen. n.

1. **argyrosplendella** n. sp.
2. **dianella** n. sp.

HOLCOCERA Clem.

1. **dives** n. sp.
   " var. *basipallidella*.
2. **aphidiella** Wlsh., Proc. U. S. Nat. Mus. xxxiii, p. 205, 1907.
3. **estriatella** n. sp.
4. **gigantella** Ch., Can. Ent. viii, 219, 1876; Bull. Geol. Surv. Terr. iii, 149, 1877; Walsingham, Proc. U. S. Nat. Mus. xxxiii, p. 205, 1907.
5. **nigrostriata** Wlsh., Proc. U. S. Nat. Mus. xxxiii, 204, 1907.
6. **purpurocomella** Clem. Proc. Ent. Soc., Phil. ii, 122, 1863; Staunton, Tin. No. Am. 229, 1872,
7. **ochrocephala** n. sp.
8. **crassicornella** n. sp.
9. **modestella** Clem., Proc. Ent. Soc. Phil. ii, 122, 1863; Stainton, Tin. No. Am. 229, 1872.
10. **chalcofrontella** Clem., Proc. Ent. Soc. Phil. ii, 122, 1863; Stainton, Tin. No. Am. 226, 1872; Zeller, Verh. zool.-bot. Ges. Wien. xxiii, p. 95, 1873; Chambers, Can. Ent. iv, 65, 1872; vi, 246, 1874; Cin. Quart. Jn. Sci. ii, 256, 1875.
    " var. *minorella*.
    " var. *fumerella*.
    " var. *quisquiliella*.
11. **confluentella** n. sp.
12. **buscklella** n. sp.
13. **sciaphilella** Zell., Verh. zool-bot. Ges. Wien. xxiii, 295, 1873; Chambers, Can. Ent. ix, 71, 1877; Busck, Jn. N. Y. Ent. Soc. x, 96, 1902; Walsingham, Proc. U. S. Nat. Mus. xxxiii, 201, 1907; Chambers (*H. triangularisella*), Cin. Quart. Jn. Sci. ii, 256, 1875; Can. Ent. ix, 71, 1877.
14. **plagiatella** n. sp.
15. **livorella** Zell., Verh. zool-bot. Ges. Wien. xxxiii, 299, 1873; syn. *livolella* Riley, Smith's List Lep. Bor. Am. 104, 1891.
16. **iceryæella** Riley, Rept. Comm. Agr. 1886, 485, 1887.
17. **maligemmella** Murtf., Mo. Agr. Exp. Sta. Bull. 49, 1898; Stedman, Can. Ent. xxx, 109, 1898; Busck, Jn. N. Y. Ent. Soc. x, 96, 1902.
18. **gilbociliella** Clem., Proc. Ent. Soc. Phil. ii, 122, 1863; Stainton, Tin. No. Am. 227, 1872; Zeller, Verh. Ent. Vet. Ges. Wien. xxiii, 95, 1873.
19. **funebra** n. sp.
    " var. *reductella*.
20. **inconspicua** Wlsh., Proc. U. S. Nat. Mus. xxxiii, 208, 1907.

21. **stygna** Wlsh., Proc. U. S. Nat. Mus. xxxiii, 207,1907.
22. **boreasella** n. sp.
23. **nucella** Wlsh,, Proc. U. S. Nat. Mus. xxxiii, 206, 1907.
24. **nana** n. sp.
25. **elyella** n. sp.
26. **insulatella** n. sp.
27. **inclusa** n. sp.
28. **simulella** n. sp.
29. **messelinella** n. sp.
    " var. *spoliatella*.
30. **morrisoni** Wlsh., Proc. U. S. Nat. Mus. xxxiii, 209, 1907.
31. **fluxella** Zell., Verh. zool-bot. Ges. Wien. xxiii, 391, 1873.
32. **clemensella** Ch., Can. Ent. vi, 246, 1874.
33. **irenica** Wlsh., Proc. U. S. Nat. Mus. xxxiii, 208, 1907.
34. **illibella** n. sp.
35. **crescentella** n. sp.
    " var. *annulipes*.
36. **spretella** n. sp.
37. **ursella** Wlsh., Proc. U. S. Nat. Mus. xxxiii, 206, 1907.
38. **punctiferella** Clem.—Gelechia—Proc. Ent. Soc. Phil. ii, 238, 1863; Stainton, Tin. No. Am. 222, 1872.
    " var. *subsenella* Zell., Verh. zool-bot. Ges. Wien. xxiii, 302, 1873.
    " var. *texanella* Wlsh., Proc. U. S. Nat. Mus. xxxiii, 211, 1907.
39. **zelleriella** n. sp.
40. **vestaliella** n. sp.
41. **tartarella** n. sp.
42. **pusilla** n. sp.
43. **rufopunctella** n. sp.
44. **melanostriatella** n. sp.
45. **interpunctella** n. sp.

EUBOLEPIA gen. n.

1. **anomalella** n. sp.

EXPLANATION OF PLATES.

Plate I.

1. *Blastobasis phycidella*, venation of forewing.
1*a*. " " venation of hindwing.
2. " *hulstella*, forewing.
3. " *yuccæcolella*, forewing.
4. " *plummerella*, forewing.
5. " *sagitella*, forewing.
6. " *distinctella*, forewing.
7. *Zenodochium citricolella*, forewing.
7*a*. " " head, showing the conchyloidal shield of basal joint of antenna.

8. *Valentinia glandulella*, venation of forewing.
8*a*. " " venation of hindwing.
9. " *quaintancella*, forewing.
10. " *floridella*, forewing.
11. " *confectella*, forewing.

Plate II.

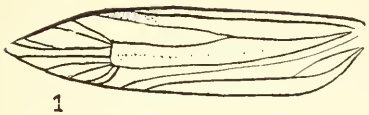
12. *Euresia pulchella*, forewing.
12*a*. " " venation of hindwing.
13. *Calosima argyrosplendella*, forewing.
13*a*. " " venation of forewing.
13*b*. " " venation of hindwing.
14. *Holcocera dives*, antenna of ♂.
15. " *estriatella*, forewing.
16. " *crassicornella*, forewing.
17. " *chalcofrontella*, forewing.
17*a*. " " antenna of ♂.
17*b*. " " basal joint of antenna, seen from before to show pecten.
17*c*. " " venation of forewing.
17*d*. " " venation of hindwing.
17*e*. " " var. *minorella*, forewing.
18. " *confluentella*, forewing.
19. " *busckiella*, forewing.

Plate III.

20. *Holcocera plagiatella*, forewing.
21. " *iceryæella*, forewing.
22. " *boreasella*, forewing.
23. " *nucella*, forewing.
24. " *nana*, forewing.
25. " *elyella*, forewing.
26. " *insulatella*, forewing.
27. " *inclusa*, forewing.
28. " *simulella*, forewing.
29. " *messelinella*, forewing.
30. " *illibella*, forewing.

Plate IV.

31. *Holcocera crescentella*, forewing.
32. " *spretella*, forewing.
33. " *punctiferella*, forewing.
33*a*. " var. *subsenella*, forewing.
33*b*. " var. *texanella*, forewing.
34. " *zelleriella*, forewing.
34*a*. " var. *annectella*, forewing.
35. " *vestaliella*, forewing.
36. " *tartarella*, forewing.
37. " *pusilla*, forewing.
38. " *melanostriatella*, forewing.
39. " *intespunctella*, forewing.
40. *Eubolepia anomalella*, forewing.
40*a*. " " head, showing front fringed each side with pectenlike hairs.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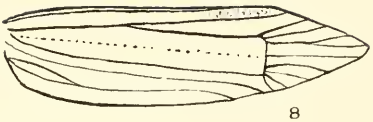
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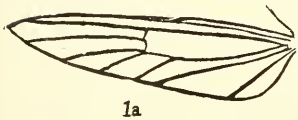
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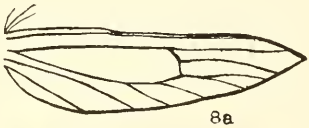
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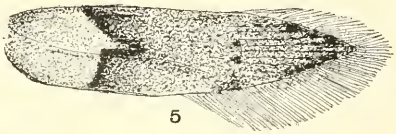
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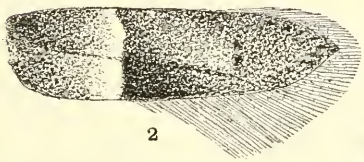
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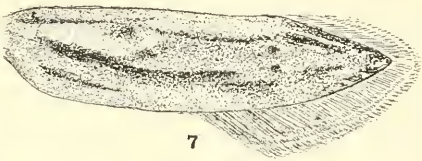
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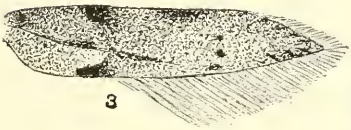
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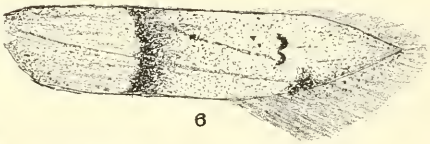
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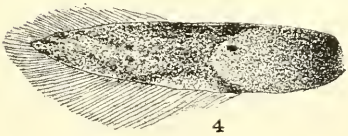
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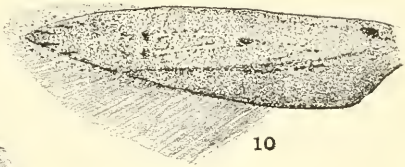
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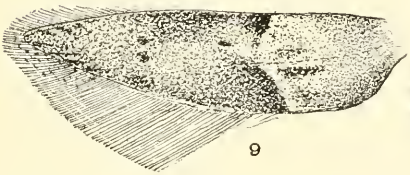
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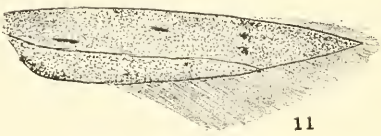
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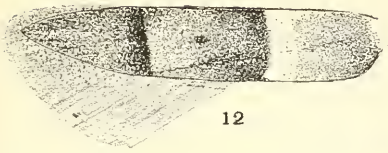
DIETZ ON MICRO-LEPIDOPTERA.



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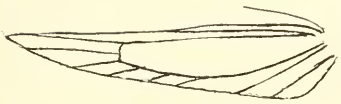

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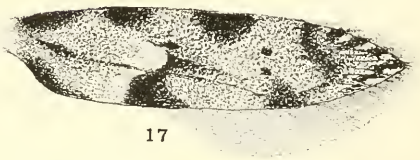

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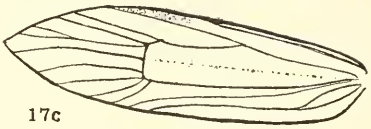

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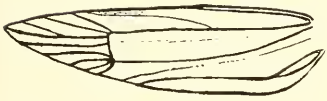

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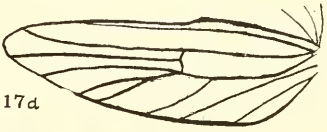

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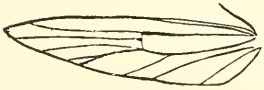

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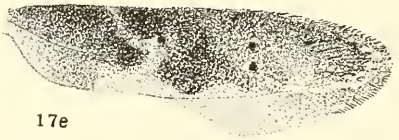

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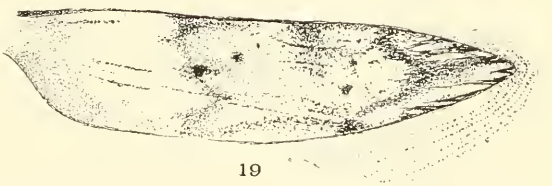

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DIETZ ON MICRO-LEPIDOPTERA.

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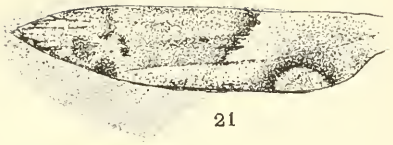

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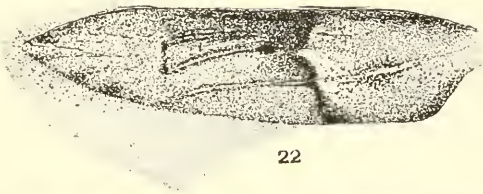

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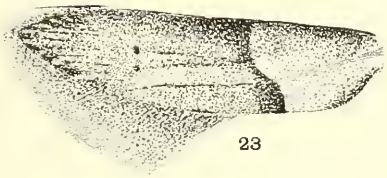

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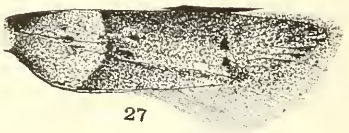

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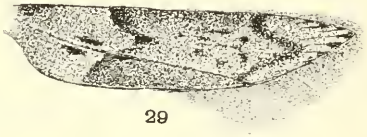

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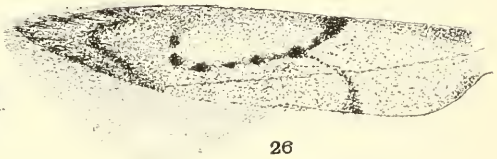

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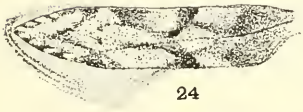

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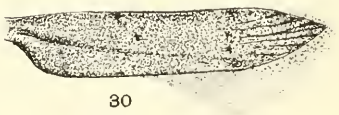

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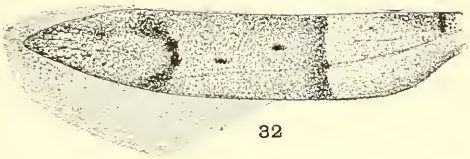

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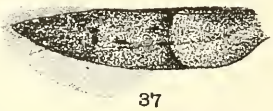

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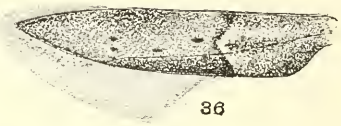

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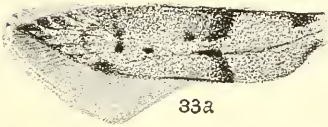

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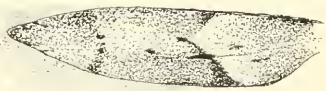

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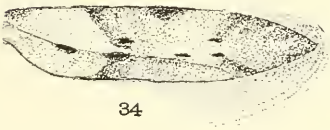

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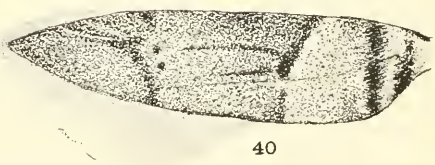

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TRANSACTIONS

OF THE

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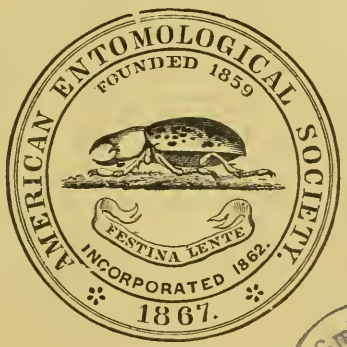

Smithsonian Institution,
AUG 8 1910
National Museum.

PUBLISHED BY THE AMERICAN ENTOMOLOGICAL SOCIETY AT THE
ACADEMY OF NATURAL SCIENCES,
PHILADELPHIA.

SUBSCRIPTION PRICE FOUR DOLLARS PER VOLUME.

DESCRIPTIONS OF SOME NEW OR UNFAMILIAR NORTH AMERICAN HEMIPTERA.

BY EDWARD P. VAN DUZEE.

NEOPHARNUS n. gen.

Closely allied to *Pharnus* but differing principally in having the head shorter, the cheeks broader, rounded, approaching and almost contiguous at apex above and beyond the tip of the narrow tylus. Antennæ longer than in *Pharnus*, the joints regularly increasing in length. Bucculæ elevated anteriorly, its angle subacute and a little advanced, posteriorly becoming evanescent opposite the middle of the eye. Rostrum attaining the apex of the third ventral segment, first joint but little surpassing the base of the head. Pronotum broader than in *Pharnus*, the lateral angles produced in a rounded subnodular lobe directed outwardly; latero-anterior margins narrowly foliaceous-expanded and eroded and armed with a few irregular tentacular teeth. Scutellum and elytra as in *Pharnus*. Abdomen broad, the connexivum expanded with the apical angles of the segments prominent. Venter with a broad flat carina in a wide shallow depression. Orifices produced in a straight sulcus which terminates abruptly about half way to the margin of the pectus. Mesosternum and tubercular base of the second ventral segment as in *Pharnus*. Tibiæ sulcate.

This genus differs from *Pharnus* in having the cheeks produced and almost contiguous before the narrow tylus and the margins of the pronotum laciniate. Type *Neopharnus fimbriatus*.

Neopharnus fimbriatus n. sp.

Broad oval with much the aspect of *Pharnus inconspicuous* H. S. Whole surface punctate and hairy. Margins of the cheeks deeply sinuated before the eyes then almost parallel to the rounded deeply notched apex of the head; the base of the tylus and a line next each ocellus smooth. Pronotum quite strongly depressed before the middle;

latero-anterior margins irregularly eroded, with about four filimentous teeth, those at the anterior angles reaching to the front of the eyes; callousities and an indistinct sublateral and median vitta smooth or somewhat calloused; the surface posteriorly with irregular transverse rugæ; the nodular humeri narrowly margined. Scutellum uneven and swollen at base; the produced apex with a thickened submargin and short median carina. Connexivum broad, deeply notched, the base of the segments swollen. Length 12 mm., width across the abdomen 8 mm.

Color obscure, fulvo-testaceous tinged with ferruginous on the base of the scutellum and the humeral angles. Whole surface punctured with fuscous; these punctures becoming black in places, especially on the middle of the pronotum anteriorly, scutellum and costal area of the corium. On the lower surface there is a line on either side of the head beneath the base of the antennæ, a dot before the eye, a curved line below the expanded margin of the pronotum, a few dots and lines on the pleural pieces and the incisures at the margins, black. Sides of the pleuræ and venter strongly irregularly punctured with black, the disk smooth. An annulus before the apex of the femora, two on the tibiæ and a point on the knees fuscous or black; middle of the antennal joints dusky.

Described from one female taken in Florida and kindly given me by Mr. J. H. de la Torre Bueno. This insect has much the aspect of a small *Brochymena*, but in its generic characters it agrees entirely with *Pharnus* except for the produced contiguous cheeks, fimbriate margins of the pronotum and produced nodular humeri.

Rhyparochromus angustatus n. sp.

Form oblong, parallel-sided; black, with the legs ferruginous and the costal and sutural margins of the corium whitish, forming a distinct M when the elytra are closed. Length 5 mm.

Head black, minutely aciculate; vertex moderately convex, nearly square; cheeks and tylus produced in a blunt triangle, the front of the head less deflexed than in the Europen *prætextatus*. Antennæ flavo-testaceous; first joint surpassing the tylus by one-third of its length; second nearly twice the length of the first, blackish at tip; third shorter than the second, piceous becoming pale at base; fourth scarcely longer than the third, blackish. Rostrum castaneous, attaining the intermedate coxæ; second joint obviously but not greatly longer than the third. Pronotum subquadrate, minutely rugulose; anterior angles moderately rounded; sides distinctly and continuously but slenderly carinated, feebly sinuated; anterior lobe slightly convex, hardly twice the length of the posterior; the latter of a velvety piceous-black, con-

trasting with the dull black of the anterior lobe ; hind margin rather deeply arcuated. Scutellum black, nearly flat, about equilateral. Elytra short, coarsely punctured ; piceous-black inclining to castaneous exteriorly on the corium and along the commissural and scutellar margins of the clavus ; the claval margin of the corium slenderly but conspicuously, and the costa more indefinately whitish, thus forming an M-shaped mark when the elytra are closed. Membrane shorter than broad, rounded behind, white at base, abruptly pitchy at apex ; Beneath black, coxæ and legs castaneous or rufo-ferruginous, darker at apex ; anterior femora piceous across the middle, strongly inrcassated, with about three small teeth along the inner (anterior) edge, the apical the larger.

Described from nine examples from Victoria (presumably Vancouver Island) in the collection of the Museum of Comparative Zoology, and five from Olympia, Washington, in the Cornell University Collection. The Victoria specimens, which were kindly sent me by Mr. Henshaw, bare the MSS. name *Megalonotus angustatus* Uhler, which I have adopted, using, however, the earlier generic name *Rhyparochromus*. The elytra sometimes become pale castaneous, but the conspicuous M-shaped marking seems to be constant. I have seen only brachypterous examples. This is the second North American species of *Rhyparochromus* known to me. Of the other, *Megalonotus sodalicius* Uhler, I have seen two examples taken in California by Mr. J. C. Bradley and belonging to the Cornell University Collection.

Plinthisus americanus n. sp.

Closely allied to the European *lasiomerus*, a little larger and paler. Head impunctate, polished, apex of the cheeks produced in a minute spine either side of the tylus. Antennæ distinctly tomentose ; first joint surpassing the tylus by one-half its length, second about one and one-half times the length of the first ; third and fourth fusiform, each about the length of the first. Rostrum reaching nearly to the front line of the intermediate coxæ, the first joint attaining the prosternum, the second slightly longer. Pronotum but little narrowed anteriorly, the sides feebly sinuated posteriorly ; anterior angles abruptly rounded behind the eyes ; posterior lobe coarsely punctured, anterior smooth, polished, with a row of small punctures behind the anterior margin ; hind edge feebly concave. Scutellum equilateral, a little raised above the elytra, closely punctured. Elytra polished, closely punctured, the punctures more obscure on the disk of the corium, those of the clavus larger and arranged in lines. Membrane short, attaining the middle

of the fifth tergal segment, rounded behind, without visable venation. Anterior femora strongly incrassated, armed with two short teeth placed inferiorly toward the apex. Length 3½ to 4 mm.

Color: Head and pronotum castaneous or piceous, the posterior lobe of the latter, the legs and the rostrum flavo-testaceous; scutellum piceous or black. Elytra flavo-testaceous or somewhat castaneous, becoming darker on the disk of the corium; membrane whitish. Beneath piceous varied with castaneous, the ventral segments edged with paler. Tergum piceous-black. Antennæ pale at base, becoming piceous apically. Normally this insect seems to be clothed with long pale hairs which are easily rubbed off.

Described from one male and two females taken at Franconia, New Hampshire, by Mrs. Annie Trumbull Slosson, and one female taken at Belleville, Ont., by Mr. J. D. Evans.

Drymus crassus n. sp.

Closely allied to *unus* Say, but larger and darker. Bucculæ more arcuated than in *unus*, leaving a broader rostral groove which reaches quite to the base of the head. Antennæ longer, the second joint proportionally longer than the third. Rostrum reaching to the posterior coxæ; in *unus* scarcely attaining the intermediate. Pronotum broader anteriorly and more convex than in the allied species; in the male the anterior lobe is scarcely if at all narrower than the posterior, the sharply carinate sides but feebly sinuated; posterior lobe a little paler and more coarsely punctured than the anterior, with a distinct medial depression as in *unus*. Scutellum as in *unus* but subcarinate behind the impressed disk. Elytra closely but more obscurely punctured than in *unus*. Pectus deeply punctured, propleura armed with a rounded tooth between the anterior coxæ which in the other species is small and acute; metapleural flaps impunctate and polished. Venter shagreened, scarcely punctured, with the minute fulvous pubescence much less conspicuous than in *unus*. Anterior femora much incrassated, armed with one stout tooth near the apex. Length 6–7 mm.

Colors darker and more obscure than in *unus*. Head, anterior lobe of the pronotum, pectus and scutellum black; antennæ, legs, posterior lobe of the pronotum, elytra and venter rufo-piceous, becoming darker on the clavus and disk of the corium. Membrane blackish-opaque, paler at base and marked with a pale spot at the tip of the corium. Rostrum and tarsi pale rufo-testaceous.

Described from three examples, one male taken by Wm. Beutenmuller in the valley of the Black Mountains, N. C., July 29th, 1906; a female from Camden, N. J., collected by S. T. Kemp, and a female taken on the summit of Mt. Washington, N. H., by Mrs. Annie Trumbull Slosson. This

is distinctly larger and darker than the species I identify as *unus*. The smaller and paler form agrees best with Say's description in having the antennæ "honey yellow," the sides of the pronotum distinctly arcuated with the carinate edges a "little depressed and translucent," and the length "one fifth of an inch," none of which characters would apply to the larger and darker *crassus*. On the other hand the elytra of the smaller species are distinctly paler on their base, a character not mentioned by Say, but this is much less conspicuous in some examples, and need not invalidate the determination.

Phytocoris bipunctatus n. sp.

Closely allied to *antennalis* and *annulicornis;* smaller, proportionately narrower and darker than the former, with the sternum and base of the femora pale sanguineous, and the elytra marked with a conspicuous round white dot near the apex of the corium. Length $4\frac{1}{2}$ mm.

Head shorter than broad; vertex, viewed from above, a little longer than the breadth between the eyes, distinctly sulcate, slightly narrowed anteriorly, sloping, and then abruptly deflexed at apex; fusco-ferruginous; clypeus prominent, black, with a large white discal spot; throat pale rufous. Rostrum attaining the base of the abdomen; rufo-testaceous, piceous at tip. Antennæ surpassing the tip of the elytra; first joint a little shorter than the basal width of the pronotum, its thickness two-thirds the superior width of the eye, minutely pubescent, fusco-ferruginous, slightly varied with pale with a whitish annulus before the middle and another near the apex; second joint slender, black, biannulate with white, the basal annulus farther from the base of the joint than in *antennalis;* third joint two-thirds the length of the second, pale brown with the broad base and an ill-defined annulus beyond the middle pallid; fourth feeble, shorter than the first and darker than the third. Pronotum sub-campanulate; sides feebly arcuated; callousities small and rounded, prominent; color fuscous, becoming black posteriorly and ferruginous brown anteriorly; hind edge white, quadrisinuate before. Scutellum fuscous-brown or almost black, with the apex whitish and sometimes with a pale spot on either side of the base of the posterior lobe. Elytra fuscous or blackish, becoming paler along the middle of the corium posteriorly and sometimes on the clavus inwardly; corium with a conspicuous round white discal spot toward the apex; cuneus deep fuscous with two black marks on the margin next the membrane. Membrane fuliginous, the nervures darker, outer edge with a small pale mark at the apex of the cuneus and a fainter one a little beyond. Beneath fuscous, becoming paler on the pectus and disk of the venter. Sternum, coxæ, trochanters

and base of the femora pale rufous; anterior and intermediate femora becoming piceous toward their apex; hind femora obscure fuscous, irrorate with paler; anterior tibiæ blackish, triannulate with white; intermediate and posterior brown, obscurely varied with pale; tarsi brown, broadly annulate with pale. Genital segment of the male with a stout curved tooth before the sinistral genital notch.

Described from numerous examples swept by me from the dry grass in the open pine forests of Florida south of Sanford, and identified as *Phytocoris antennalis* in my list of Florida Hemiptera. This species is very close to *antennalis*, and especially to *annulicornis*, but I believe it distinct. The white elytral spots and the color of the legs are distinctive and apparently persistent. The general color also is darker than in *annulicornis*, and the basal joint of the antennæ is shorter than in *antennalis*.

Last July I took a characteristic example of *antennalis* at Ipswich, Mass., which extends its range considerably to the north.

Dichrooscytus marmoratus n. sp.

Pale yellowish-green more or less washed with clear green, especially on the pronotum and clavus, sometimes, and in life perhaps always, clear green on the pronotum, scutellum and elytra; costa, at least narrowly, yellowish; cuneus toward its apex and the veins of the membrane sanguineous; membrane fuscous irrorate with pale, especially toward the base, and marked with two larger pale spots on the margin beyond the tip of the cuneus; apical nervure of the corium darker or even sanguineous. Surface polished, clothed with short blackish hairs on the pronotum and elytra, with a few longer black hairs near the anterior margin of the pronotum. Head yellow, polished, impunctate; in the female broader than the front of the pronotum, but much narrower than in *suspectus;* base of the vertex very obscurely impressed either side. Antennæ rufo-testaceous, first joint surpassing the apex of the head by nearly one-half its length; second about four times the length of the first and about one-half its thickness, linear; third slender, one-half the length of the second, darker at apex; fourth still shorter and thinner but longer than the first, fuscous. Pronotum polished, impunctate; sides straight; collum linear, distinct; callousities prominent. Beneath yellowish, the propleura tinged with green. Legs pale, the tibiæ sometimes tinged or irrorated with rosy pink; tibiæ darker at apex; tarsi brown, black at tip. Length 5 mm.

Described from numerous examples taken at Almagordo, New Mexico, belonging to the Academy of Natural Sciences

of Philadelphia, and kindly loaned me for study by Dr. Skinner. The males have the pronotum more narrowed anteriorly, the eyes more prominent, the vertex narrower and more depressed and the rostrum shorter, not surpassing the hind coxæ. Of perhaps 150 specimens sent most were of some shade of yellowish-green, but a few were of a clear green with the sanguineous color confined to the margin of the cuneus and veins of the membrane. This species differs from *Dichrooscytus* by the narrower head, almost immarginate vertex, and longer basal joint of the antennæ. It has, however, the impunctate pronotum and general facies of this genus, and I believe it should stand here and not in *Lygus*. The irrorate membrane is conspicuous and distinctive.

Lopidea cuneata n. sp.

Oblong-ovate, broader than *media* and its allies; fuscous-brown with the narrow costa and the cuneus pale. Length 6 mm.

Head fuller and proportionately broader than in *media*, the vertex not so sunken; face broader below, the margins distinctly rounded beyond the insertion of the antennæ; color pale flavo-testaceous, base of the vertex black, large disk of the front fuscous with a broad pale longitudinal vitta; clypeus black, polished. Antennæ black; first joint as long as the width between the eyes; second as long as the head and pronotum together; third two-thirds the length of the second; fourth hardly so long as the first. Rostrum attaining the posterior coxæ or nearly so; piceous, with the sides of the first joint paler. Pronotum fuscous, with the anterior margin and the sides narrowly pale; broader and shorter than in *media;* the callousities very strongly elevated, almost tubercular, separated by a deep impression; anterior margin feebly concave, broadly depressed; sides broadly reflexed, a little sinuated; hind margin slightly concavely arcuated; posterior lobe dull, transversely rugose with a feeble depression. Scutellum fuscous, moderately convex. Elytra a little shorter and broader than in *media*, fuscous-brown; base, costa, and a short streak on the base of the cubital vein slenderly pale, the commissural nervure very narrowly so; cuneus pale, tinged with rufous within and tipped with black; membrane dark fuliginous. Beneath brown, more or less tinged with rufous along the sides. Legs brown; coxæ, trochanters, and sometimes the base of the femora whitish; propleura pale or suffused with rufous.

Described from one male and four female examples which were beaten from a large balsam poplar tree at Lancaster,

N. Y., on August 4, 1906, where they seemed to be feeding on plant lice. This species is a true *Lopidea*, although it is broader and darker than any other species yet described from this country. The pale streak on the cubital nervure, and the whitish or rosy cuneus readily distinguish this species.

Mr. Fordyce Grinnell, Jr., has taken an insect on the San Jacinto Mountains, California, at an altitude of 5000 feet, which probably belongs to this species. It is darker on the head, abdomen, and elytra, and the latter wants the pale streak on the cubital nervure and the black tip to the cuneus, and the scutellum is rufo-piceous.

Hadronema festiva n. sp.

Form of *picta* but with the vertex swollen as in *robusta*. Color black, corium orange with a large black spot on the inner angle. Length 3½ mm.

Head prominent, the vertex strongly convex, especially in the female; front vertical, strongly impressed at the base of the very convex tylus. Rostrum reaching nearly to the base of the intermediate coxæ. Antennæ about as in *picta*, first joint very short and stout, armed with a few stiff black hairs; second over three times as long as the first, minutely pubescent; third a little longer than the second and thinner; fourth still more slender and shorter than the first. Pronotum longer than in *picta*, strongly narrowed anteriorly; sides feebly sinuated; hind margin slightly concave; humeral angles prominent; surface roughly shagreened; collar very narrow but distinct.

Color blackish piceous, sericeous pubescent and quite strongly pruinose, especially beneath; pronotum, elytra, and legs with longer whitish hairs; inner cheeks paler; slender hind edge of the ventral segments pale; corium fulvous, fading to yellowish inwardly and marked on the inner angle by a large blackish spot which connects with the black of the clavus; membrane smoky iridescent and paler at the margin and along the cuneus, the nervures blackish.

Described from numerous examples taken at Alamagordo, New Mexico, in late April and early May, belonging to the Museum of the Academy of Natural Sciences of Philadelphia. I can find no description agreeing at all with this insect. In many examples there is a greenish incrustation occupying the depressions on the base of the vertex and on the sides of the pronotum behind the callousities.

CYPHOPELTA n. gen.

Related to *Closterocoris*, but with the pronotum subcylindrical before, much as in *Pseudoxenetus*, and the scutellum strongly tumid. Head about as in *Closterocoris*, long ovate-conical, placed obliquely; vertex longitudinally feebly convex, sloping almost from the base, transversely a little convex; tylus with a longitudinal abbreviated groove on either side; loræ elongate-conical, convex; cheeks prominent; gula broad, convex, with a longitudinal depression on either side anterior to the eyes; eyes much elongated and placed obliquely. Antennæ slender, as long as the pronotum and elytra together. Rostrum reaching between the intermediate coxæ; first joint attaining the middle of the gula. Pronotum long, anterior lobe almost cylindrical, callousities scarcely distinguished; posterior lobe short, abruptly flaring. Scutellum strongly convex, with a deep constriction between the anterior and posterior lobes; the former partially exposed, the latter greatly elevated in a hemispherical nodule. Elytra longer than the abdomen, almost parallel, the sides very narrowly reflexed; surface obscurely punctured. Legs long and slender, the hind femora exceeding the tip of the abdomen; anterior coxæ strongly swollen. Type.—*C. modesta* n. sp.

Cyphopelta modesta n. sp.

Long, parallel sided; rufous; head, membrane, and apex of the abdomen black, elytra twice banded with white. Length 8 mm.

Head black, becoming piceous anteriorly, the orbits of the eyes dull rufous. Antennæ soiled testaceous; first joint as long as the greatest width of the head, lineate with piceous beneath; second more than twice the length of the first, linear, minutely sericeous; third about two-thirds the length of the second; fourth longer than the first but shorter and thinner than the third. Rostrum pale rufous, base and apex piceous. Pronotum minutely transversely rugulose, anterior lobe a little swollen before the transverse constriction; dull rufous, shading to piceous posteriorly, and in a less degree anteriorly; hind edge slightly emarginate and slenderly edged with white. Scutellum impunctate, highly polished on the tumid posterior lobe, which is elevated to the level of the highest point of the pronotum. Elytra and scutellum clear light rufous; the corium marked with an oblique slightly curved, narrow white vitta a little before the apex of the clavus, and

a blackish cloud on the apex inwardly; base of the cuneus broadly white; membrane blackish fuscous, the nervure still darker. Legs and beneath light rufous; osteolar orifice white; venter piceous black, polished, becoming rufous on the base and oviduct, the sixth connexival segment terminating in a distinct spine; posterior femora a little darker; tips of the tibiæ and the tarsi blackish.

Described from one female example taken on Mt. Wilson near Los Angeles, California, June 5, 1909, by Mr. Fordyce Grinnell, Jr. This is a handsome and interesting addition to the Hemipterous fauna of California. It recalls the Lygæid *Pamera bilobata*, but pertains to Reuter's new division *Cremnocephalaria* of the Capsidæ.

Elidiptera fusiformis n. sp.

Quite distinct from any other species known to me. Front banded; vertex short, elytra expanded at base, and vaguely banded with brown at base and across the middle. Length to apex of the elytra 11 mm.

Head short; vertex almost square, median line sulcate, lateral carinæ oblique, base broadly arcuated, almost parallel with the anterior margin. Front oblong, broadest at the apical one-fourth, sides sinuated, broadly laminate-expanded and translucent, apex angularly but not deeply excavated, median carinæ weak. Clypeus sub-triangular, sides feebly arcuated. Pronotum a little longer than the vertex, strongly carinated, hind margin angularly and rather deeply emarginate. Patagiæ large, transverse. Mesonotum large, closely aciculate, median carina feeble, lateral arcuated, strong anteriorly, weak posteriorly. Elytra fusiform when closed; broad at base, much narrower toward the apex.

General color piceous brown, becoming paler on the vertex, pronotum, apex of the elytra and abdomen; irregularly varied and irrorate with pale; carinæ and margin of the various parts mostly pale; apex of the scutellum whitish. Elytra closely inscribed with white, forming a broad band across the basal third, but omitting the humeral angles; apical third paler and less clearly inscribed; middle of the broad costal areola with three approximate oval black spots, and there is a brown patch on the stigma and a few smaller marks near the apex; nervures mostly pale. Front and pectus cream white with a narrow piceous band on the base, which crosses the eye and becomes black on the propleura; clypeus brown. Coxæ and legs pale brown. Abdomen pale brown, darker on the sides and apical segment. Wings slightly enfumed with brown nervures.

Described from one female in the collection of the Museum of Comparative Zoology which bear the label, "Goose Lake,

Siskiyou Co., Calif., Hollemann." This species has the banded front of *pallida* and the short vertex of *variegata*, but the form and general aspect are quite distinctive.

Elidiptera Henshawi n. sp.

Allied to *pallida*, but proportionately longer; front strongly banded, clypeus brown. Length to tip of the elytra: male, 9 mm.; female, 11 mm.

Head shaped as in *pallida*. Vertex elliptical, scarcely longer than broad, a little elevated at the apex, margins sharply carinate, median impressed line distinct. Front elliptical above, broader and rounder toward the apex; median carina distinct, apex obtusely angularly emarginate; clypeus elongate-triangular; its sides nearly rectilinear. Pronotum as in *pallida*, about as long as the vertex, rather broadly rounded before, broadly and obtusely emarginate behind. Patagiæ transverse, larger than in *pallida*. Mesonotal carinæ prominent. Elytra oblong, parallel, but little narrowed to the base. Last ventral segment of the female narrower than in *pallida*, and more angularly emarginate at apex. Ventral tooth of the male pygofer broad, subangularly emarginate at apex, as long as the base of the segment.

Color fuscous-brown above, minutely irrorate with pale, vertex and pronotum sometimes a shade paler; elytra obscurely varied with darker and marked with about two blotches on the discal areola, and three round blackish points on the middle of the costal. Beneath and legs pale brown; base of the front and sides of the pleural pieces piceous, sharply distinguished from the pale yellowish apex of the front and chest.

Described from one male and four females taken at "Pressy's" in Wenas Valley, Washington, July 6, 1882, by Mr. Samuel Henshaw, to whom I dedicate the species in acknowledgement of the willing assistance he has so frequently extended to me in my insect studies. This species has about the form of *septentrionalis*, but it is larger, and has a strongly banded front.

Helicoptera pinorum, described by Mr. A. B. Manee in the Entomological News for March, 1910, is the female of *Elidiptera opaca* Say, as I know from a specimen which he kindly sent me for my collection.

Elidiptera floridæ Walker.

Smaller than any of the allied species, about the size of *Catonia grisea*. Vertex strongly produced, considerably longer than its basal width, exceeded in length only in *colorata*, elliptically narrowed to the

rounded apex, median line sulcate. Front narrower than in *septentrionalis*, its sides more strongly sinuated and with the median line carinate. Pronotum produced almost to the anterior line of the eyes, truncate before; hind margin angularly emarginate, about as in *septentrionalis;* lateral carinæ prominent, median almost obsolete. Mesonotum but feebly convex, carinæ subobsolete, except the median for a short space anteriorly. Elytra narrow, the costa but feebly expanded.

Color a uniform fuscous-brown, scarcely varigated, a little paler on the vertex and pronotum; patagiæ pale cinerous. Elytra a little darker, very obscurely irrorated with pale posteriorly and with the costa somewhat paler; three black points near the apex as in most of the allied species, but none in the costal areole. Front of a uniform dark brown, its carinate edges and those of the vertex pointed with black; clypeus deep fuscous, almost black; sides beneath with a broad percurrent whitish vitta beginning on the cheeks before the antennæ, bordered above with blackish; posterior coxæ and the genital segments paler. Legs concolorous, brown. Wings deeply enfumed with fuscous nervures. Length scant 7 mm.

Lakehust, N. J., one male, taken May 29th by Mr. W. H. Davis. This insect agrees with Walker's description in every respect, except that the pale irrorations of the upper surface are almost obsolete and the red spot at the base of the abdomen on either side is represented by pale ferruginous. I have no doubt but it is the species described by him.

A single female, taken at the same place and but one day earlier, may belong to this species. It has a much shorter vertex and is paler with the elytral maculation quite distinct; the costal areola has the usual three black points, there are two larger ones on the disk of the corium, and the three near the apex are conspicuous; the front is broader with its sides rectilinear, its basal third is blackish, the apical two-thirds and the clypeus are a uniform brown; the lateral white vittæ beneath are scarcely distinguished, but the bounding black vitta above it is conspicuous. The differences here are more than I have seen between the sexes of any other species of *Elidiptera*, but I do not care to separate them without more material. Were it not for the very different shape and coloring of the front and vertex I would have no doubt about this being the female of *floridæ*. I now follow Kirkaldy and others in using the name *Elidiptera* Spinola, in place of

Helicoptera A. and S., for which latter name there seems to have been no adaquate justification.

Catonia dimidiata n. sp.

Allied to *impunctata* Fitch, but easily distinguished by having the front entirely black, with the clypeus white, and the vertex and pronotum without the black discal foveæ. Head, pronotum, and mesonotum ferruginous-brown becoming light on the disk of the vertex and pronotum, and on the base and apex of the discal area of the mesonotum, the carinæ lighter anteriorly; discal areolæ of the vertex marked with darker brown. Front black, becoming ferruginous on the rounded apex of the head, margins strongly elevated, not obviously constricted between the eyes; clypeus white, minutely dotted with brown along the elevated margins; cheeks black above, white below, the antennal sockets pale. Pronotum dark brown beneath the eye, the carinæ and included surface paler, yellowish; patagiæ a little darker. Elytra testaceous brown, a little infuscated on the base of the corium, behind which is a vague whitish cloud; transverse veinlets and apex of the clavus whitish. Wings smoky with fuscous nervures. Legs whitish with a dusky spot on the base of the hind tibiæ exteriorly. Abdomen paler at apex and on the edges of the segments in the female; blackish in the male. Female genitalia substantially as in *impunctata*. In the male the median tooth of the basal valve is short triangular, its blunt apex attaining the middle of the plates, the margins either side of the tooth forming a moderate sinus and then retreating to the basal angles. In *impunctata* this median tooth is long and acute, attaining the apex of the plates, and the margins either side are deflected at right angles, making the basal portion of this valve of nearly equal length across its whole width. Length 6 mm.

Described from one female taken by me at Phoenicia, N. Y., in August, 1904, and one male and two females taken by Prof. John Barlow at Kingston, R. I. This is the "variety" of *impunctata* noticed by Fitch. In my review of this genus in 1907 I included it as the female of that species, having at that time seen only females of this form and males of the other. The present series from Prof. Barlow, however, shows them to be distinct species. *Catonia impunctata* has the carinæ and a transverse band on the front white, the median areoles of the vertex and pronotum, the deflected sides of the pronotum and the patagiæ black, and the chest and legs are immaculate whitish.

Catonia costata n. sp.

Small, testaceous brown, front unicolorous. Length 4½ mm.

Vertex broad and rounded before, its length scarcely more than one-half the width between the eyes; sloping from the base; the marginal and median carinæ moderately elevated; basal margin very feebly excavated, nearly straight. Front broad, oblong, slightly wider at apex, sides nearly rectilinear, surface convex, the carinæ feebly elevated. Clypeus broad and short, rounded at base, the carinæ feeble. Pronotum proportionately broad, about half the length of the vertex, less deeply and acutely emarginate than in our other species, carinæ moderately elevated; mesonotal carinæ distinct, nearly parallel. Elytra about as in *impunctata*, the nervures impunctate.

Color dull testaceous-brown; head paler and more tinged with ochreous; pronotum pale with a blackish cloud beneath the eye. Elytra fuscous-brown, the nervures paler in places; the short transverse nervures and the costa whitish, but not conspicuously so. Wings smoky hyaline, nervures fuscous; pectoral pieces fuscous, margined with pale; abdomen blackish, the segments more or less edged with ferruginous or dull sanguineous; genital pieces whitish. Legs pale testaceous-brown, the tarsal spines tipped with black.

Described from one female and five male examples taken by Mr. Fordyce Grinnell, Jr., on the San Gabriel Mountains near Pasadena, California, on June 17, 1909, at an altitude of 3000 feet. This is a plain little species of the size and form of *pumila*, but very distinct in the characters of the head and the unicolorous elytra and impunctate nervures, in which latter character it agrees with *impunctata*. It bears a slight resemblance to *Plectoderes basalis* Fowler, but is smaller and wants the pale base to the elytra.

Catonia cara n. sp.

Widely distinct from any described North American species. Pale luteo-testaceous becoming castaneous on the base of the elytra, behind which is a broad transverse pale band. Length 6 mm.

Head short and broad as in *costata*. Vertex transverse, anterior and posterior margins almost parallel, slightly arcuated, its length about two-thirds the width between the eyes; carinæ distinct, forming an obtuse triangle; anterior edge rounded to the broad rather convex front on which the carinæ are but feebly raised; clypeus longer than in *costata*. Pronotum very short, linear. Mesonotal carinæ straight and slightly divergent posteriorly. Elytra ample, rather thin, nervures impunctate.

Head, pleural pieces and legs pale yellowish testaceous; antennal setæ and tarsi black; thorax and elytra luteo-testaceous; lateral com-

partments of the mesonotum and base of the elytra as far as the apex of the scutellum pale cataneous ; beyond this on the closed elytra is a broad transverse pale yellowish vitta, which is broader on the commissure where it touches the point of the scutellum and apex of the clavus ; transverse nervures near the apex indistinctly paler ; ground color of the elytra intensified next the pale transverse band. Abdomen more or less fulvous.

Described from one pair taken in copulation on Mt. Wilson, California, September 14, 1908, by Mr. J. C. Bradley. This species is very distinct by its yellowish color and the broad transverse pale band bordered with castaneous, on the elytra.

Cixius lepidus n. sp.

Black, with the carinæ marked with flavo-testaceous. Elytra whitish hyaline, the base and a large stigma fuscous ; nervures strongly punctured with fuscous. Length : male, 5 mm. ; female, 6½ mm.

Head well produced ; vertex almost quadrangular, its length about equal to the width between the eyes ; passage to the front broadly rounded, without the transverse apical compartment found in our other species ; basal compartment almost an equilateral triangle, its apex rounded, its surface depressed, punctured, with a median carina at base. Front broad, but moderately narrowed at base ; median carina distinct, third ocellus obsolete, apical suture strongly arcuated. not at all angled in the female, scarcely so in the male ; color piceous, becoming paler or testaceous at base, especially in the female. Clypeus deep black, median carina paler, lateral carinæ slender and scarcely paler. Pronotum of equal length across its whole width ; pale brownish-testacous, darker in the fovæ, black under the eyes. Tegulæ large and conspicuous, testaceous-white. Mesonotum black ; carinæ and hind margin of the scutellum pale in the female. Elytra hyaline with a very decided milky cast ; a transverse band across the apex of the scutellum which may include the whole basal portion of the elytra and the large stigma, deep fuscous ; veins strongly dotted, the transverse nervure toward the base fuscous. Wings whitish hyaline with slender brown nervures. Beneath black ; disk of the metapleura in part fulvo-testaceous. Legs brown, the acetabulæ, knees, and bases of the tibial spines pallid. Sides of the genital segment of the male broadly rounded, the ventral sinus broad, with a very short rounded median tooth ; plates very short, but little exceeding the sides of the genital segment, ob-triangular or imperfectly fan-shaped at apex, which is touched with whitish ; pygofers but little exceeding the plates, subconical at apex, and including the fulvous anal tube. In the female the apical projection of the pygofers is unusually large, slender and acute at tip. In both sexes the lower surface and genital segment are covered with a whitish tomentum.

Described from one pair taken at Boulder, Colorado, by Prof. T. D. A. Cockerell in August and September. This species has much the aspect of *basalis*, but it is smaller and is well distinguished by the quadrate vertex with long basal fovæ and the want of a transverse compartment at apex. It makes an interesting addition to our Fulgorid fauna.

Stenocranus felti n. sp.

Closely allied to *dorsalis* and *lautus*, differing principally in having the apex of the vertex broader and more rounded, the front proportionately broader and shorter, with the intra-carinal compartments pale brown or almost concolorous, and the pygofers of the female much broader toward their apex, almost pyriform.

Color a soiled yellowish-testaceous with the carinæ a little paler and the dorsum marked with a whitish vitta from near the front of the vertex to the tip of the scutellum, which is continued by the pale commisural nervure of the closed elytra. Basal joint of the antennæ with a black mark inferiorly, a similar mark is on the cheek below the ocellus, and the antennal socket has a distinct black marginal spot anteriorly. Connexival segments and outer pleural pieces with blackish spots, those of the metapleura much larger and deeper black. Femora and tibiæ lineated with black; pygofers of the female dark brown; the tergum mostly black. Venter in the male black with the segments edged with orange. Elytra in the female pale yellowish hyaline with the nervures a little darker, sometimes becoming almost black on the clavus and inner margin of the corium; the second apical nervure and the apex of the others deep black. In the male the nervures are almost entirely blackish fuscous, and the black of the second apical nervure is spread over the adjoining areole. Length to the tip of the abdomen 3 mm.; to the tip of the elytra in the longest winged examples 5 mm.

Described from numerous specimens taken by me at Bretton Woods, N. H., June 30, 1909, and one female taken at Speculator, N. Y., July 20, 1909, by Dr. E. P. Felt, to whom I take pleasure in dedicating this pretty species. Speculator is located in the Adirondack region of New York state, and my specimens, which were swept from a low wooded swamp back of Mt. Washington Hotel, are from the base of Mt. Washington, where the insect fauna is very similar to that of the Adirondacks

MISCELLANEOUS NOTES AND DESCRIPTIONS OF NORTH AMERICAN COLEOPTERA.

BY H. C. FALL.

No apology need be offered I think for the miscellaneous character of the present contribution ; such papers are occasionally necessary if we would preserve the casual observations and discoveries in taxonomy, synonymy, distribution, etc., which must occur with every student of our Coleoptera. On the other hand, new species are still accumulating so rapidly that repeated effort on the part of the systematist is necessary in order to keep anywhere near abreast of the collectors and to assimilate the new material. It is neither possible nor in all cases desirable to present a complete synopsis of a group or genus in which new species are being made known, and a certain amount of isolated description is justifiable if care is taken to bring the new forms into line with present knowledge by careful comparison with the old and familiar.

CICINDELIDÆ.

CICINDELA Linn.

C. vulgaris var. **viridissima** new var.

This name is proposed for the well-known bright green variety of *vulgaris* occurring in Southern California. This form goes as *vibex* in most collections although it has been correctly pointed out that the true *vibex* of Oregon and Northern California is of a dark dull green color. The bright green form is sometimes locally abundant near San Bernardino and Colton, and I have recently seen a beautiful series taken in both October and March by Mr. G. R. Pilate. Mr. Hopping takes it commonly in Tulare County, where also occur darker examples which approach in color the true *vibex*.

CARABIDÆ.

CYCHRUS Fab.

C. corvus n. sp.

Form rather narrowly oblong oval, depressed, black throughout, feebly shining. Head narrow, eyes prominent, surface smooth, evenly convex. Prothorax $2\frac{1}{3}$ times as wide as the head, $\frac{3}{4}$ as long as wide,

widest at middle, sides moderately strongly rounded anteriorly, convergent and feebly sinuate posteriorly, the hind angles prolonged over the elytra; apical margin very broadly posteriorly arcuate between the reflexed sides, disk broadly convex and impunctate, median line fine in front, deeper behind, side margins moderately reflexed in front, more widely so behind. Elytra $\frac{2}{3}$ wider than prothorax and nearly three times as long, $\frac{1}{2}$ longer than wide, lateral margin reflexed anteriorly, more strongly so around the humeri, disk flattened, 14 or 15 striate, the striæ moderately impressed, rather finely punctate, somewhat irregular or confused laterally. Inflexed portion of the elytra sparsely, finely, obsoletely punctate; abdomen impunctate. Length, 16.5 mm.; width, 6 mm.

Chiricahua Mountains, Arizona. A single male specimen collected and given me by my friend Mr. V. W. Owen of Los Angeles.

In all essential characters this species is nearly related to *van dykei*. The color is at first glance entirely black, but in certain lights the elytra show the faintest imaginable hint of a dark purplish reflection. The front tarsi are, as in *van dykei*, strongly dilated, the first joint triangular and a bit longer than wide, the second quadrate, and the third smaller and evidently transverse. The two species are quite different in their minor characters, *van dykei* being a distinctly less elongate species and more prettily colored, the thorax rather closely punctate and with side margins more widely reflexed, the elytral striæ finer but more coarsely punctured, and the reflexed portion of the elytra and sides of the ventral segments numerously punctate.

CALOSOMA Web.

C. parvicollis n. sp.

Deep black throughout, without metallic lustre except very faintly in the concave elytral margins; head and prothorax somewhat shining, elytra duller. Head fully $\frac{2}{3}$ as wide as the prothorax, rather finely and moderately closely punctate between the eyes, becoming nearly smooth in front; epistomal impressions rather deep. Prothorax from a little less than to fully $\frac{2}{3}$ wider than long, sides rather sharply angulate at middle, arcuate in front, straight behind, a little sinuate just before the hind angles; base also distinctly sinuate near the angles, making the latter evidently acute; base narrower than the apex; disk finely punctate, becoming more distinctly so near the margins, finely rugous posteriorly; basal impressions moderate. Elytra $\frac{3}{5}$ longer than wide,

and about $\frac{7}{10}$ wider than the prothorax; a little wider at apical third, more noticeably so in the female; elytral series of punctures unimpressed, very fine, becoming subobsolete on the declivity, connected by transverse impressed lines in basal third, except near the suture; the interstitial punctures on intervals 4, 8, 12, fine but discernible. Legs moderate. Length 21–24 mm.

Southern California (San Bernardino, Riverside and Pasadena).

Parvicollis is closely allied to *prominens*, from which it differs most obviously in its more finely punctured head and relatively small prothorax. Careful measurements of the specimens in my collection show that the relative width of elytra to thorax varies in *prominens* from 1.39 to 1.58 (ave. 1.48) and in *parvicollis* from 1.64 to 1.73 (ave. 1.69). The difference is quite conspicuous when series are compared. *Prominens* is also a larger species; it is common in Arizona, but whether it occurs in California is uncertain, the specimens recorded under this name in my Southern California list being the one here described.

C. eremicola n. sp.

Form of *peregrinator*, black throughout, without trace of metallic lustre. Head finely punctate, and subrugulose; sides of prothorax narrowly rounded or subangulate, nearly as in *peregrinator*. Elytra about $\frac{2}{3}$ longer than wide, the punctured series feebly impressed basally, the punctures rather coarse in basal two-fifths, thence becoming rapidly smaller, very minute apically; sides near the humeri with a few rather faint transverse rugæ. Length, 17–19 mm.; width, 8–10.3 mm.

San Clemente Island, Southern California.

Described from a single pair collected and given me by Mr. Don Ross of Pasadena, California.

The above very brief description is sufficient when the differences between it and *peregrinator* have been pointed out. The size is very much smaller in *eremicola*, the sides of the prothorax a little less evidently angulate, the elytra relatively shorter, the ratio of length to width being 1.44 in the male and 1.40 in the female; while in *peregrinator* the length ranges from 1.60 to 1.75 times the width. The strial punctures of the elytra are much coarser basally in *eremicola*, and the last ventral of the female is unmodified. In *peregrina-*

tor (♀) the last ventral is finely punctate and bristling with short erect black hairs. This character, which seems to have escaped notice hitherto, may be relied upon to separate *peregrinator* from all allied forms.

C. tristoides n. sp.

This name is proposed for a form occurring in our extreme southwestern region, which is closely related to but quite surely distinct from *triste* of the West Central States. As compared with Kansas specimens of *triste* in my collection, *tristoides* differs in the much finer punctures of the elytral series, these becoming very minute posteriorly, and in the usually well developed greenish lustre of the elytral margins. The sides and basal impressions of the prothorax also show more or less of the metallic lustre in many specimens, but in some it is barely perceptible. The coarser serial punctures of intervals 4, 8, 12 are green as in *triste*, but in the latter species the side margins of the body are scarcely at all so. In the type series of three examples of *triste* in the LeConte collection the sides of the prothorax are evenly rounded and the elytra are parallel in both sexes. In *tristoides* the prothorax exhibits considerable inconstancy in both relative and actual dimensions, the width varying from 1.53 to 1.72 times the length, the sides either evenly rounded or evidently straighter posteriorly, ; the basal sinuations are also variable in depth. The elytra are quite uniformly parallel in the male and a little wider posteriorly in the female. It is, however, very probable that a good series of *triste*, or for that matter of any other species of Calosoma, would show similar variability. In length *tristoides* ranges from 22 to 24 mm., width 9.4–10.2 mm. The length given for *triste* in LeConte's table is 18 mm.

Tristoides is based on a good series taken by Mr. Ricksecker at or near San Diego, California.

A single specimen from an unknown source and simply labeled "Cal." has stood for years in my collection as *triste*. There is a single example from "Cal." in the LeConte collection placed near but not in line with his specimens of *triste* and bearing a "?" label.

DYSCHIRIUS Bon.

D. varidens n. sp.

Moderately elongate, black, with more or less distinct green-bronze lustre, legs and antennæ dark rufous. Epistoma tridentate, the middle tooth either nearly as acute and prominent as the lateral ones, or merely an obtuse prominence, with all intermediate degrees of development. Front transversely sulcate, smooth. Prothorax ovate, very slightly wider than the prothorax, $\frac{3}{5}$ as wide as long, sides parallel and very broadly arcuate in basal two-thirds, base with entire marginal line; striæ very lightly impressed, nearly obsolete for a short distance at base, and faint but traceable for a longer distance at apex; strial punctures rather fine, separated by their own diameters or a little more, becoming rapidly finer behind the middle, and disappearing before the apex; third interval tripunctate. Length, 2.7–3 mm.; width about 1 mm.

California (Los Angeles—type, Pasadena, Azusa, Pomona, Santa Cruz, Santa Clara County, San Francisco, Humboldt County, Mohawk).

By the basal marginal line of the elytra this species is to be associated with *tridentata*, *patruelis* and *basalis*, and should follow the first named species. It is always smaller than *tridentata*, with paler legs and antennæ, and with finer elytral striæ, which are more nearly obliterated at apex and less punctured. *Patruelis* has entirely black legs and antennæ, and the median clypeal tooth is obsolete. Specimens of *varidens* with poorly developed median clypeal tooth would go as *analis* by the LeConte table, but the latter is a stouter species, the elytra shorter and more robust, with deeper more closely punctate striæ.

BEMBIDIUM Lat.

In his preliminary remarks on the *litorale* group of this genus Hayward describes the mentum tooth as "large and entire." Possibly this statement is traditional; it is in any case based on very insufficient study, since a careful investigation reveals an unusual and most surprising amount of variation in this respect among the few species that constitute the group. The form of the tooth is quite constant within specific limits, so far as my material goes, and taken together with a second character to be mentioned below

enables us to more readily and accurately separate the species than has been possible. It seems to have entirely escaped notice that in certain species of this group the seta near the middle of the side margin of the prothorax is lacking. The marginal setæ are normally two in number, one in the hind angle, and the other usually a little in advance of the middle. In one species—*laevigatum*—there are two additional setæ close together at the anterior angle. The seta in the hind angle is probably present in every species of the genus, though I have not attempted to verify this. The submedian seta is almost as universally present. Specimens of course frequently occur with some or all of the setæ absent, but the presence of the setigerous punctures in the margin in the vast majority of instances shows that they have been accidentally lost. In three species of the present group, however, the submedian seta is persistently lacking, and the absence of a puncture in the margin shows that this is the normal condition. Whether there are any other native species of the genus which show this peculiarity I can not positively say, but it seems very unlikely, since in the 121 species in my collection I find no other exception to the rule. In the European *litorale* the submedian seta is also lacking, and this enables us at once to separate it from the *lacustre* of LeConte, which differs furthermore in the form of the mentum tooth. *Lacustre* must, therefore, be restored to specific standing. It is indeed doubtful if the true *litorale* occurs at all in this country. Collectors should carefully examine their material in this group, and if native specimens are found it would be well to publish the fact. Two new species from the west coast appear in the following table and *litorale* is included for comparison:

Side margin of thorax without median seta.

Mentum tooth elongate parallel, rounded or subtruncate at tip; fourth dorsal stria sinuate; size comparatively small; form narrow and convex.....**inæquale.**

Mentum tooth shorter and broader, sides converging in front, the tip truncate and usually more or less emarginate.

Form slender and convex (size of *inæquale*), fourth stria not or very feebly sinuate, strial punctures coarse .....**hesperum.**

Form broader and more depressed, size larger, strial punctures relatively fine.

Thorax nearly as long as wide, base and apex subequal; fourth stria sinuate.....**litorale.**

Thorax evidently though not strongly transverse, base wider than apex; fourth stria not distinctly sinuate.....**lorquini.**

Side margin of thorax with median seta.

Mentum tooth shorter, triangular; thorax strongly transverse, apex nearly as wide as base.

Mentum tooth acute at apex; hind angles of thorax evidently carinulate.....**carinula.**

Mentum tooth truncate and usually somewhat emarginate at apex; hind angles of thorax not distinctly carinate.....**zephyrum.**

Mentum tooth elongate, parallel, tip truncate; thorax moderately transverse, apex evidently narrower than the base.

Fourth elytral stria sinuate; size smaller.....**lacustre.**

Fourth elytral stria not sinuate, size larger....**punctatostriatum.**

B. hesperum n. sp.

Moderately elongate and convex, green bronze, first four elytral intervals in great part, and the fifth at middle dark cupreous or cupreo-violaceous, the quadrate impressions green; surface throughout alutaceo-granulose, more finely so on the prothorax and on the cupreous elytral areas, which are more shining. Palpi dark, more or less pale at base; basal joint of antennæ pale beneath. Prothorax fully four-fifths as long as wide, widest at middle, base one-fourth wider than the apex; sides finely margined, moderately sinuate behind, the hind angles not very prominent, sharply defined, almost rectangular; surface finely transversely creased or wrinkled; median line almost entire; basal impressions unistriate, the angles not carinate. Elytra about three-fifths wider than the prothorax, striæ somewhat impressed, rather coarsely and closely punctate, more finely apically as usual; fourth not or scarcely sinuate. Beneath greenish-black, legs pale at base. Length, 5.2–5.3 mm.; width, 2.2–2.25 mm.

Vancouver Island (type) and California (Placer County).

As its position in the table indicates, this species is nearest *inæquale*, with which it agrees nearly in general form. It seems to average a trifle larger than *inæquale*, and is more prettily colored; the hind angles of the prothorax are not quite so prominent and are slightly obtuse; the tibiæ, palpi, and base of antennæ less pale. The mentum tooth is rather short, subtriangular, the tip truncate and a little emarginate.

B. zephyrum n. sp.

Form broad, subdepressed, viridiaeneous, prothorax at middle, elytra with a basal spot occupying intervals 3–5, and a broad central stripe dilated at middle and enclosing the quadrate impressions, blackish purple; surface alutaceo-granulose, the dark areas more finely so and less dull. Antennæ and palpi entirely dark metallic. Prothorax slightly more than two-thirds as long as wide, base but little wider than the apex, sides more widely margined and not deeply sinuate behind, the angles nearly right; surface slightly wrinkled transversely on the disk, longitudinally at base; median line nearly entire; base angles with a very feeble oblique carina. Elytra one-half wider than the prothorax, the striæ finely punctate, the fourth not or but slightly sinuate. Body beneath greenish; legs pale at base. Length, 5.25–6 mm.; width, 2.4–2.6 mm.

The series before me includes specimens from Humboldt County, California (type), collected by Van Dyke, and from Newport, Oregon, collected by Wickham.

This species approaches *carinula* in its strongly transverse prothorax, but differs from it and from all our other species of this group in having the side margin of the thorax slightly wider and subexplanate anteriorly.

B. whitneyi n. sp.

Rather broad, moderately convex, black, elytra each with a subtriangular subhumeral spot, and a transverse lunate subapical spot, pale, surface scarcely æneous, strongly shining, either polished throughout or with the elytra barely detectably alutaceous. Head as wide as the thorax at apex; palpi and antennæ black, the latter one-half the length of the body. Prothorax barely one-third wider than long, base and apex subequal, sides distinctly sinuate behind, the angles rectangular; basal impressions wrinkled and punctate, the inner stria deep, the outer feeble; hind angles carinate. Elytra one-half wider than the prothorax and nearly three and one-half times as long, sides parallel in basal two-thirds, humeri rounded, striæ very fine, not impressed, the outer ones feeble or obsolete, the discal one traceable to apex; third stria with two setigerous punctures situated nearly at the basal and apical thirds. Body beneath and legs black and shining. Length, 4.75–5.2 mm.; width, 1.8–2.2 mm.

Mt. Whitney, California—8,000 to 11,000 feet. Collected and given me by Mr. F. S. Daggett.

The pale elytral spots are quite bright in the type, but more obscure in two other examples. *Whitneyi* is allied most nearly to *breve*, which is a smaller entirely black species, the prothorax more transverse and with the hind angles obtuse. It was also taken by Mr. Daggett on Mt. Whitney.

B. versicolor; B. timidum; B. pictum.

I cannot at all agree with Hayward in his interpretation of the above named forms, and am convinced after a study of the types that the Henshaw List is correct in giving *pictum* specific standing, and that *timidum* is really a synonym of *versicolor* as was previously supposed.

Hayward separates *versicolor* and *timidum* primarily on the completeness of the lateral striæ of the elytra, these being abbreviated behind in the former, and entire in the latter. To this is added—head usually more evidently alutaceous in *timidum* and the prothorax more strongly rounded in front and more sinuate behind in *versicolor*. My own study leads me to believe that it is impossible to base a distinction on the lateral striæ, as every degree between the extremes may be found in a large series of specimens, which are so completely in accord in other respects that their identity can not be doubted. If, however, we take the secondary character above mentioned, separation of the two species is not difficult. The type of *versicolor* is from Lake Superior; it has the head distinctly alutaceous, the sides of the prothorax nearly as much so, the surface becoming smoother at the middle, sides of thorax moderately rounded and sinuate. This species is an abundant one in the northern half of the United States and Canada, extending from the Atlantic to the Pacific. The western specimens are more likely to have the lateral striæ of the elytra entire, and one of these from the Rocky Mountains served as the type of *timidum*. *Pictum* was also described from the Rocky Mountains. It is almost invariably smaller than *versicolor*, the head not alutaceous except very finely so posteriorly, the front between the eyes always polished, the prothorax polished throughout and more deeply sinuate behind. The lateral striæ vary in their development in the same way as in *versicolor*, and as a result specimens are indiscriminately mixed with *versicolor* and *timidum* as separated by Hayward.

I do not know how far *versicolor* extends its range in the east, nor how for east and north *pictum* occurs, but *versicolor* is essentially a northern and *pictum* a southern species. On

the Pacific Coast *versicolor* is rarely found south of Central California; *pictum* is known to me from Louisiana to Southern California.

Unfortunately, as has already been pointed out in the books, the name *pictum* is preoccupied, and we must use Motschulsky's name *flavopictum* for this species.

HYDROPHILIDÆ.

CRENIPHILUS Mots.

At the time of Dr. Horn's synopsis of this genus in 1890, a single species only—*degener*—was known with 7-jointed antennæ. This extreme reduction in the number of joints was commented upon as being quite remarkable, and it is certainly not less so that of the four new forms discovered since Horn wrote, all, without exception, possess this peculiarity. Of these four, one—*elegans*—has been previously described; the others are now made known.

C. lodingi n. sp.

Oval, moderately convex, very slightly less than twice as long as wide, black, not or but very faintly æneous, lateral margin with a sharply defined pale border, narrow on the prothorax, becoming wider toward the apex of the elytra, where it involves about one-fourth or one-fifth of the sutural length. Antennæ, palpi and legs pale, except the femora, which are in great part dusky. Punctation of elytra coarse and rather close, the punctures separated by from a little less to a little more than their own diameters; head and prothorax somewhat more finely punctate. Body beneath blackish, opaque, finely pubescent: front and middle thighs pubescent; hind thighs glabrous, impunctate and without strigosity; hind tarsi and tibiæ subequal in length, the latter possibly a trifle longer. Prosternum carinate; mesosternal keel strong. Length 2.3–2.5 mm.

Mobile, Alabama.

Described from a series of nine examples collected and given me by Mr. H. P. Loding, to whom it is a pleasure to dedicate the species in recognition of his painstaking and very successful efforts in collecting the smaller and more obscure species of his fauna.

The present species is remarkable, first for its 7-jointed antennæ, and again for its very close affinity to *C. elegans* of California. The two are virtually identical in every respect

except sculpture, the punctuation of *elegans* being much sparser and finer. Elegans has thus far been found only in salt pools or springs, while *lodingi* occurs in fresh water creeks as I am informed by its discoverer.

C. ellipsis n. sp.

This name is proposed for a form closely related to *elegans* and *lodingi*, agreeing with them in antennal, sternal, and crural characters. The sides of the prothorax are not distinctly paler, being but feebly and diffusedly so at the extreme margin ; the elytra are paler at sides but not very evidently so basally, and the pale border is nowhere sharply defined as it always is in *elegans* and *lodingi*. The punctuation is finer than in either of the two allied species, being on the head and thorax exceedingly fine and remote. The size is apparently slightly smaller and the form just visibly more convex. Length, 1.8–2.2 mm. ; width, 1–1.2 mm.

Described from two examples given me by Mr. Schwarz by whom they were collected at Hot Springs, Arizona.

Var. **nanus** n. var.

Several specimens from Capron and Lake Harney, Fla., recently sent for examination by Mr. Schwarz are exceedingly closely allied to the typical Arizona specimens of *ellipsis*, but differ constantly in their smaller size ; the elytral punctuation seems also relatively a little coarser ; for these the above varietal name may be used. Length, 1.6–1.8 mm. ; width, .8–.9 mm.

C. reductus n. sp.

Elliptical, four-fifths longer than wide, rather strongly convex, piceous black, surface at most very faintly æneous; sides of prothorax narrowly, gradually diffusedly paler, sides of the elytra toward the apex similarly but more broadly so. Antennæ 7-jointed. Head and prothorax polished and very finely and sparsely punctulate ; elytra more evidently and more closely punctate, the punctures toward the sides and apex separated by their own diameters or a little more, somewhat finer and sparser on the disk basally, surface between the punctures dulled by the presence of a system of ground sculpture consisting of very fine punctures and short irregular lines. Beneath opaque, hind femora stout, glabrous, shining, with a few fine scratches toward the base. Prosternum carinate ; mesosternal keel not very strongly developed, the free angle conical and acute. Length, 1.6–1.8 mm. ; width, .9–.95 mm.

Capron, Florida (Hubbard and Schwarz).

The five species of *Creniphilus* with 7-jointed antennæ are readily separated as follows:

Prothorax and elytra with sharply defined pale margin which is broader behind.
Punctuation fine and sparse (California).....**elegans.**
Punctuation much coarser and closer (Alabama).....**lodingi.**
Prothorax and elytra gradually suffusedly paler at sides.
Form less convex, upper surface polished throughout and finely punctate (Arizona, var. *nanus* Florida).....**ellipsis.**
Form more convex, elytra with alutaceous sculpture.
Prothorax minutely sparsely punctate, elytra relatively coarsely punctured (Florida).....**reductus.**
Prothorax distinctly moderately closely punctate, elytra without punctures (Florida).....**degener.**

STAPHYLINIDÆ.

MYCETOPORUS Mann.

Our species of *Mycetoporus* are divisible into two well marked groups which are at least subgeneric. In the first, including the majority of the species thus far described, the middle and hind tibiæ are fringed with coarse unequal spinules, the antennæ are relatively short, the pronotum has two sublateral discal punctures, one behind the other, and there are no sexual modifications of the abdominal apex. In the second group the four posterior tibiæ are densely fringed with short equal spinules, the antennæ are longer and heavier, the pronotum is entirely devoid of discal punctures, and the abdominal apex shows well marked modifications in the male.

One new Californian species belonging to the first group and two to the second are here described. *M. splendidus* has been taken at McCloud in Northern California by Dr. Fenyes. The Santa Cruz Mountains species referred to in my South California list as being near *splendidus* is included with *hospitalis* described below.

M. neotomæ n. sp.

Fusiform, piceous, prothorax and sometimes the head and abdominal apex rufous. Antennæ dusky, pale at base and apex, not passing the basal margin of the prothorax, gradually incrassate, the outer joints becoming transverse, the eleventh not quite as long as the two preced-

ing. Penultimate joint of maxillary palpi narrow, subparallel, nearly three times as long as wide. Head, including the mandibles, longer than wide, eyes moderate. Prothorax with two lateral discal punctures. Elytra a little wider than long, all the angles indefinitely paler, sutural stria distinct, each with a sutural, marginal, and three discal series of setigerous punctures, about ten punctures in each series except the outer discal one, which has only five or six, the first and second discal series more or less irregular. Abdomen moderately strongly punctate. Legs rufous, the thighs darker; middle and hind tibiæ fringed with unequal spinules. Length 3½–4 mm.

Pasadena, California.

Taken thus far only in wood rats' nests (April). In its three series of discal punctures on the elytra *neotomæ* most nearly agrees with *consors*, but the punctures of the two inner discal series are finer and more irregular than in *consors*, the body broader and the form of the penultimate joint of the maxillary palpi is longer and less triangular.

Consors is said by Horn to have two discal series of punctures on the elytra; there is, however, a distinct third row outside these which was mentioned by LeConte in his original description.

M. hospitalis n. sp.

Rather slender, entirely rufotestaceous, surface polished and strongly shining. Head as wide as or a little wider than long, impunctate; eyes moderate, the length of the head behind them subequal to that of the eye itself. Antennæ elongate, reaching the middle of the elytra when the head is deflexed, joints 7–10 subquadrate, the others more or less strongly elongate, terminal joint not quite as long as the two preceding together. Prothorax entirely without discal punctures. Elytra a little wider than long, without sutural stria, with three rows of setigerous punctures as usual, about six punctures in the sutural row, and eight in each of the others. Abdomen coarsely but not closely punctate; epipluræ impunctate, metasternum finely punctured; terminal spinules of the four posterior tibiæ of nearly equal length. Length 3 mm.

California.

Four examples taken by Dr. Fenyes in nest of wood rat (Neotoma) on Mt. Lowe (6000 feet) near Pasadena. With these are associated two examples from the Santa Cruz Mountains and Santa Clara County which appear to be structurally identical, but differ in having the prothorax and elytra pice-

ous in great part. The type above described is a ♂, having at the apical margin of the fifth ventral a group of asperate punctures bearing short stiff bristles, the sixth deeply triangularly emarginate at apex, and the seventh very narrowly but deeply triangularly incised. The short equal spinules of the posterior tibiæ associate this species with *splendidus* and *flavicollis*, with which it agrees also in the absence of all pronotal discal punctures. Dr. Horn intimates in his general remarks on *Mycetoporous* that there are in all species two discal punctures, one behind the other, between the middle and lateral margin. He either failed to observe or omitted to note that these punctures are not present in those species having the middle and hind tibiæ fringed with equal spinules. As remarked by Casey, LeConte's original descriptions were more precise in this respect. The absence of the sutural stria is peculiar to this and the following species, and there is little doubt from the appearance of the elytra that these species are truly apterous.

M. myops n. sp

Head, prothorax, and elytra piceous, highly polished, abdomen dark rufous, legs and antennæ pale rufous. Head longer than wide, eyes small, the distance from their posterior margin to the base of the head nearly twice the length of the eye. Antennæ distinctly shorter than in the related species, joints 6–10 evidently transverse, 11th as long as the two preceding. Prothorax without discal punctures, the two median ones of the basal margin more removed from the margin than usual, being nearly at the basal fourth. Elytra a little transverse, no sutural stria, with sutural series of four setigerous punctures, dorsal series of five or six, and marginal series of eight. Abdomen sparsely finely punctate. Length 2½ mm.

Fieldbrook, Northern California. (Mr. H. Barber.) Very closely allied to the preceding, differing in the smaller size, narrower head, smaller eyes, different position of the median marginal punctures at the base of the pronotum, and in the more finely sparsely punctured abdomen.

BLEDIUS Leach.

B. armatus Say.

There is in my collection a series of specimens from Nebraska—in part collected by Mr. Knaus—which agree perfectly with Say's description of this species, and are, I

think, unquestionably representatives of the species he had in hand. If so, the pale color as described by Say is normal and not due to immaturity as LeConte believed, and the true *armatus* is not at all the species accepted as such by that author, and following him by all our later Coleopterists. In genuine *armatus* the color is ordinarily pale yellow, the head, abdominal apex and sutural bead black or blackish; sometimes the prothorax and abdomen are of a darker shade than the elytra, but are never black. In *armatus* as defined by LeConte the body is black, the elytra varying from rufous to piceous, the abdominal apex paler. In this the hind angles of the prothorax are broadly rounded and undefined; in *armatus* they are distinct and slighty prominent. The *armatus* of LeConte is a common species, widely dispersed over the western United States, and naturally subjected to some variation, but I am thus far unable to find in a quite extensive material from different localities any satisfactory characters for specific separation. One of these local races served as the type for *strenuus* Csy., and this name should now be used for the species.

B. arizonensis n. sp.

Rather slender, black, or piceous black, trochanters and tarsi dark rufous, tibiæ more or less rufopiceous. Antennæ entirely black or piceous, second joint a little stouter and longer than the third, the latter twice as long as wide and subequal in length to the next two; outer joints gradually wider, 7–10 distinctly transverse. Head densely finely granulato-reticulate, a few fine and feeble punctures posteriorly, vertex with a feeble median tubercle divided by a short impressed line. Prothorax a little wider than the head, a little wider than long, sides parallel in apical two-thirds, then very broadly rounded into the base, the lateral and basal angles completely undefined, apical angles right but rather broadly rounded, surface granulato-reticulate and dull like that of the head; punctuation sparse, moderately coarse; median line strongly impressed. Elytra at base a little wider than long, sides nearly straight and evidently divergent, apical angles broadly rounded, surface shining, rather closely but not coarsely punctate. Abdomen finely reticulate and sparsely finely punctate above, more closely punctate beneath, with very fine reticulato-rugulose ground sculpture. Hypomera vaguely concave posteriorly, not impressed along the outer margin, the width at apex about half that at base, which is subequal to the length of the coxal fissures, the latter almost completely closed. Length 4.3–4.9 mm.

Flagstaff, Arizona. (Dr. Fenyes.)

The epistomal angles are evidently but not strongly tuberculate in much the same degree in the eight specimens before me, all of which appear to be female by the structure of the eighth ventral. This species is to be referred to the *armatus* group of LeConte, and is apparently nearer to *strenuus* (*armatus* Lec, not Say) than to any other of the group. In *strenuus* the head is relatively narrower as compared with the prothorax, the size distinctly larger, the color never as nearly black, the legs, antennæ and abdominal apex invariably paler.

B. episcopalis n. sp.

Black, elytra and legs bright rufous, the latter gradually narrowly infuscate at base, front coxæ darker. Antennæ rufous basally, blackish outwardly, second joint distinctly longer and stouter than the third, barely as long as the third and fourth together, penultimate joints quite strongly transverse. Head very slightly narrower than the prothorax, finely granulose and dull, with a few fine scattered punctures and a rather strong impressed vertical tubercle; epistomal suture arcuate, distinctly impressed, anterior angles of epistoma tuberculate, antennal prominences strong. Prothorax a little wider than long, sides almost perfectly straight and parallel for three-fourths their length, then rather suddenly convergent and feebly arcuate to base, the base angles very obtuse and indistinct but traceable; surface finely granulato-reticulate and somewhat shining, median line well impressed, punctures rather fine and sparse. Elytra just visibly wider at base than the prothorax, scarcely as long as wide, about one-fifth longer than the prothorax, sides moderately divergent, punctures more closely placed than on the prothorax, being separated by about their own diameters. Abdomen very remotely finely punctate above, less sparsely so beneath. Prosternal sutures obliterated, the hypomera very little narrowed in front, impressed along the side margin, coxal fissures about as long as the adjacent width of the hypomera, apparently closed or very nearly so when viewed from the side, narrowly open when viewed from the front. Mentum concave, more deeply so basally, shining, lightly reticulate. Length 3.6–4.3 mm.

Bishop, California. (Dr. Fenyes.)

A member of the *armatus* group, differing from the other species of like size by the strongly tuberculate head in the male.

B. gradatus n. sp.

Black, prothorax reddish brown, elytra paler rufous, abdomen rufescent at apex, legs bright rufous, antennæ rufous at base, dusky toward the apex. Antennæ gradually incrassate, joints 6–10 increas-

ingly transverse, 2–3 subequal and fully twice as long as wide, each nearly equal to 4–5 together. Eyes very convex. Head not as wide as the prothorax, finely granulato-reticulate and feebly shining, vertex with a prominent divided tubercle, exterior to which are a few punctures; anterior angles of epistoma strongly tuberculate in the male, epistomal suture strong, arcuate. Prothorax barely one-fifth wider than long, sides parallel and nearly straight for three-fourths their length, then strongly arcuately convergent and rounded into the base, the hind angles undefined, the front angles narrowly rounded; surface shining, finely granulato-reticulate and rather coarsely punctate, the punctures separated by from one to one and one-half times their own diameters; median line sharply impressed throughout. Elytra at base equal in width to the prothorax, as wide at apex as the sutural length, sides straight and a little divergent behind, surface moderately shining, as coarsely but slightly less densely punctate than the prothorax. Abdomen slightly narrower than the elytra at base, slightly increasing in width apically, above finely reticulate, moderately shining, very sparsely feebly punctate; beneath numerously rather finely punctate, the interspaces very finely punctulate rather than reticulate. Hypomera flat, a little narrowed anteriorly, coxal fissures narrowly open, prosternal sutures obliterated but traceable. Length, 5.2–5.5 mm.; width, 1.2–1.35 mm.

California. Desert region near Keeler, collected by Dr. Fenyes.

This species seems closely related to *eximius* Csy., in which, however, the vertex is not evidently tuberculate, the color and some other details somewhat different. It resembles *flavipennis* Lec. also, but the latter has the prothorax very lightly punctate, the median impressed line feeble.

B. consimilis n. sp.

Head and abdomen black, prothorax rufo-piceous, elytra yellowish with the suture and base narrowly dusky, legs and antennæ flavo-testaceous. Head and prothorax finely granulato-reticulate, and feebly shining, elytra distinctly finely reticulate, moderately shining, abdomen reticulate, moderately shining. Second antennal joint evidently stouter and a little longer than the third, but much shorter than the next two together; tenth joint about one-half wider than long. Head (♂) impunctate with a small but distinct impressed vertical tubercle; antennal prominences strong, epistomal angles strongly but finely tuberculate, epistomal suture strongly impressed. Prothorax slightly wider than the head, a little wider than long, sides parallel and very broadly arcuate for three-fourths their length then arcuately narrowed

almost to the base, the hind angles a little prominent, slightly obtuse, not rounded, the outer sides parallel for a short distance; apical angles slightly obtuse and narrowly rounded; surface very sparsely irreguarly punctate, the median impressed line very indistinct and incomplete. Elytra a little longer than the prothorax, nearly as long as wide, at base just visibly wider than the prothorax, sides slightly divergent, conjointly broadly angulate emarginate at apex, the sutural angles very narrowly rounded; punctuation rather strong and close. Abdomen with a few scattered fine punctures above, beneath sparsely finely punctate. Prosternal sutures obsolete, hypomera strongly narrowly impressed along the outer margin, within the impression feebly convex, strongly narrowed in front, the width at apex being but little more than half that at base, where it is nearly twice as great as the distance to the coxæ; coxal fissures short, rather narrowly open. Length 4.1 mm.

Thorton, New Mexico. (Dr. Fenyes.)

This species is from description closely related to *cuspidatus* and *tenuis*. The former is considerably larger (5.5 mm.), the head is said to have a large vertical fovea, and the hind angles of the prothorax are wanting.

Tenuis agrees more nearly in size (4.5 mm.), and has the hind angles of the prothorax minutely prominent, but the epistomal suture is feebly impressed and the vertex not tuberculate.

B. tallaci n. sp.

Black, elytra dark red-brown, feebly clouded with piceous at base, abdominal apex narrowly paler, legs rufous. Head and prothorax densely strongly granulato-reticulate, the former dull, the latter very feebly shining; elytra polished; abdomen distinctly reticulate, moderately strongly shining. Antennæ rufous at base, darker externally; second and third joints subequal, tenth as long as wide. Head finely, sparsely, obsoletely punctate at sides posteriorly, occipital fovea small, the surface in front of it faintly tumid; epistomal suture fine, scarcely impressed, the anterior angles of epistoma finely tuberculate. Eyes rather large and prominent. Prothorax a little wider than the head, one-seventh wider than long, sides straight and parallel from apical fifth to three-fifths, convergent and nearly straight behind, the lateral angles somewhat evident, the basal ones rounded and indistinct, sides rounded in front, the apical angles obtuse and narrowly rounded; median line deeply impressed, punctuation rather close and coarse. Elytra at base slightly, near the apex one-fourth wider than the prothorax, the suture slightly longer, the maximum length three-sevenths longer than the prothorax, very little wider than long, punctuation

close and even. Abdomen sparsely finely punctate above, more conspicuously so beneath. Prosternal sutures prominent, the hypomera nearly flat, feebly impressed at sides, about one-half as wide at apex as at the coxal fissures, which are closed and just perceptibly shorter than the adjacent hypomeral width. Length 4.9 mm.

Lake Tahoe (Tallac), Calif. Collected by Dr. Fenyes.

The type is a male having the sixth ventral broadly but distinctly emarginate in circular arc, the surface near the margin bearing numerous yellow setæ which are longer at sides. In the modification of the sixth ventral of the male *tallaci* agrees with *grividus* Csy. which is differently colored, has the pronotum in part polished, the tenth antennal joint transverse, and the prothorax sparsely and unevenly punctate. A male specimen in my collection from Lake County, California, is quite surely Casey's *foraminosus*, which was described from the female. In this male the sixth ventral is setiferous posteriorly, but the segment is scarcely perceptibly emarginate. Very closely allied are *deceptivus* Fall, and *relictus* Fall, the sixth ventral of the male in both of these being precisely as in *foraminosus*.

B. dissimilis n. sp.

Black, elytra rufo-ferruginous, with the base and suture dusky, antennæ, legs and abdominal apex rufous. Head and thorax densely granulato-reticulate, the former dull, the latter feebly shining, abdomen feebly reticulate and shining, elytra polished. Second antennal joint a little stouter and slightly longer than the third, the latter three-fourths longer than the fourth, penultimate joints a little wider than long. Head distinctly but sparsely and rather finely punctate, vertex feebly tumid at middle, behind which is a more or less distinct fovea; epistomal angles feebly finely tuberculate, suture fine and distinct but scarcely impressed. Prothorax evidently wider than long, sides parallel and slightly arcuate in apical three-fourths, then broadly rounded and convergent at base, the base angles rounded and not defined; dorsal line fine but distinctly impressed, the punctures moderate in size, separated by about their own diameters. Elytra at base scarcely wider than the prothorax, nearly as long as wide, sides moderately divergent, punctuation rather close and well impressed. Abdomen gradually notably wider behind, finely sparsely punctate, beneath more evidently so. Prosternal sutures distinct, oblique, hypomera nearly flat, rather feebly impressed along the outer margin, the width at apex about half that at the coxal fissures, the latter closed and a little shorter than the adjacent hypomeral width. Length 3.6–4.2 mm.

Philadelphia, Pennsylvania. Two examples so labeled in Dr. Fenyes' collection.

The type is a male having the posterior margin of the sixth ventral obliquely beveled in its middle third; the beveled area apparently membranous, about four times as wide as long, arcuate in front, nearly straight behind. This species resembles *semiferrugineus* but is somewhat smaller, with much less coarsely punctate head and thorax. *Gravidus* agrees well in most respects but it too is larger, the abdomen is said to be parallel, and the sexual characters are quite different.

B. piceus n. sp.

Black, prothorax piceous, tip of abdomen, legs and antennæ rufous, the latter slightly dusky apically. Head and prothorax densely finely granulato-reticulate, the former dull, the latter feebly shining; elytra shining, abdomen finely reticulate and shining. Second antennal joint about one-half longer than the third and not very much shorter than the third and fourth together, tenth nearly one-half wider than long. Head with a few fine and feeble widely scattered punctures posteriorly, vertex evenly broadly convex, the occipital puncture small; epistoma simple (♀), suture fine, somewhat impressed; eyes rather small and not very prominent. Prothorax very slightly wider than the head, not much wider than long, sides straight and parallel in apical three-fourths, thence convergent and straight to base; lateral angles very obtuse but distinct, basal angles less obtuse and not well defined, apical right and rather narrowly rounded; punctuation fine and sparse, median line fine but well impressed. Elytra scarcely wider at base than the prothorax, as long as wide, the sutural length subequal to that of the prothorax, sides a little divergent, punctuation rather close, the punctures moderate in size. Abdomen gradually wider posteriorly, finely very sparsely punctate above, rather coarsely and much more closely so beneath, especially toward the base. Prosternal sutures distinct and moderately oblique, the hypomera evidently impressed along the outer margin; coxal fissures a little shorter than the adjacent hypomeral width, almost completely closed. Length 3.9 mm.

California—Pasadena and Oceanside (Fenyes). A specimen from Colorado collected by Prof. C. F. Baker is apparently identical.

A somewhat small and inconspicuous species belonging to the *semiferrugineus* group, to none of the members of which it seems very closely related. In general appearance it is

not greatly unlike *assimilis*, but in the latter the prothorax is distinctly smaller, the dorsal line obsolete, the punctuation closer and the tenth antennal joint is not transverse.

B. specularis n. sp.

Head and abdomen piceous, prothorax and elytra dark castaneous, the latter broadly suffusedly blackish along the base and suture; legs and antennæ rufous, the latter a little darker apically. Upper surface strongly shining, the head very evidently so although distinctly granulato-reticulate; prothorax finely subobsoletely reticulate laterally, becoming quite smooth toward the middle of the disk; elytra polished, abdomen finely reticulate. Eyes only moderately prominent. Antennal joints 2–3–4 gradually decreasing in length, tenth a little transverse. Head impunctate except for the occipital puncture, before which the vertex is distinctly tumid; epistomal margin minutely tuberculate each side, the frontal suture somewhat impressed. Prothorax distinctly wider than the head, nearly as long as wide, sides very broadly arcuate and parallel in rather more than apical three-fifths, then convergent and feebly undulate to base, the lateral angles rather distinct, basal angles scarcely defined, median line fine and lightly impressed, punctuation very sparse, the sides rather broadly subimpunctate. Elytra a little wider than the prothorax, fully as long as wide, very slightly widened behind, punctuation sparse, deep, and coarse. Abdomen finely very sparsely punctate above, beneath much more coarsely and closely so. Hypomera not strongly narrowed in front, distinctly impressed along the outer margin, the prosternal sutures distinct; coxal fissures closed and about as long as the adjacent hypomeral width, mentum rather strongly and broadly concave. Length 4.3 mm.

California. Two examples collected by Dr. Fenyes at Point Reyes.

This species belongs to the *semiferrugineus* group, but does not closely resemble any previously described. It is very close to the following one, and the two may be only varietal forms of one species.

B. regularis n. sp.

Very closely allied to the preceding in all respects except the following. The vertical tumidity is very faint, occipital puncture very small or obsolete, pronotum strongly granulate-reticulate throughout and much less shining, the median line finer, the punctuation less sparse toward the side margin, elytra a little more closely punctured.

California—Cole. Siskiyou County, six examples collected by Dr. Fenyes.

This species comes from the interior of the extreme northern part of the State, close to the Oregon line, while *specularis* occurs near the coast just north of San Francisco. These two forms have probably diverged in comparatively recent times, but seem fairly well differentiated, and if not already distinct are quite sure to become so. The two specimens of *specularis* known are both females, and have the epistomal margin simple or very nearly so. The type of *regularis* is a male, having the epistoma distinctly tuberculate each side, the female having the epistoma simple. *Piceus* is also allied to these, but differs in its smaller elytra, which are also more closely punctate.

B. persimilis n. sp.

Black, legs and antennæ rufotestaceous, the penultimate joints of the latter just perceptibly darker. Head and prothorax very finely granulato-reticulate, the former feebly, the latter quite evidently shining; elytra polished, abdomen very indistinctly though rather coarsely reticulate and strongly shining. Second antennal joint nearly as long as the next two, the fourth as wide as long, fifth evidently transverse, tenth twice as wide as long, eleventh subequal in length to the two preceding. Eyes not very prominent. Head nearly evenly convex, almost impunctate, occipital fovea small but distinct, epistomal suture very fine, not impressed. Prothorax slightly wider than the head, a little wider than long, sides nearly straight and parallel in apical three-fifths, thence straight and just perceptibly sinuate to the hind angles, which are obtuse, well defined but not prominent, lateral angles somewhat defined, median line prominent, lateral angles somewhat defined, median line fine but well impressed, punctuation rather fine, moderately sparse. Elytra at base very slightly wider, and at apex about one-fifth wider than the prothorax, about one-third longer than the latter, sides feebly divergent, punctuation close and rather fine. Abdomen sparsely finely punctate, beneath more closely and less finely so. Prosternal sutures strong, parallel with the margin, hypomera flat, not perceptibly impressed along the side margin, slightly narrowed at the coxal fissures, which are open and about twice as long as the adjacent hypomeral width. Mentum with a well defined transversely oval impresion occupying the basal three-fifths and the middle two-fourths. Length 2.5–2.7 mm

California—Pomona (type), Santa Clara County. Four examples.

This species is evidently very closely allied to Casey's *gentilis* and *gracilis*, but differs from each in several details. In *gracilis* the median groove of the pronotum is said to be very wide, deep and conspicuous, the second joint of the antennæ much longer than the next two and the mentum not impressed. In *gentilis* the size is somewhat greater, the antennæ are in great part black, the occipital fovea lacking, the elytra relatively both wider and longer than in *persimilis*, the hypomera only one-third as wide as their distance from the coxæ.

B. mysticus n. sp.

Rather robust, black, legs and basal two joints of antennæ rufous. Head and prothorax densely granulose and dull, elytra and abdomen polished and strongly shining, the latter finely reticulate. Second antennal joint nearly as long as the next two, tenth nearly twice as wide as long. Head broadly convex, a transverse almost entire impressed occipital line, which deepens into a foveiform impression at middle; epistomal suture fine, not impressed, punctuation fine, sparse, shallow. Prothorax a little wider than the head, somewhat transverse, sides broadly arcuate in front, the curvature continuous but stronger posteriorly, hind angles rather abruptly formed, fairly well defined, short, and but little obtuse; front angles a little obtuse and narrowly rounded; median line fine, lightly impressed, very slightly abbreviated in front; punctuation rather fine, uniformly distributed, except as usual along the median line, the punctures nearly twice their own diameters apart. Elytra about as long as wide, fully one-third longer than the prothorax, sides feebly divergent to apex, surface moderately closely and strongly punctate. Abdomen finely very remotely punctate above, a little less sparsely so beneath. Hypomera about two-fifths as wide as their distance from the coxæ, a little narrowed anteriorly, concave posteriorly; the prosternal sutures distinct; coxal fissures long, open, the surface immediately in front of them transversely impreseed. Mentum broadly evenly concave, reticulate and shining. Length 3.6–4 mm.

Washington (State)—type; Kalispell, Montana (Wickham).

This species belongs to LeConte's *annularis* group, and judging from description is allied in a general way to *sinuatus*, which differs in color and is said to have the median impressed line of the prothorax nearly obsolete. *Monticola*, *gentilis* and *gracilis* of Casey are also related, but are all too

small, and each differs in several details. *Languidus* Csy., is still nearer, but the head is said to be not foveate, the elytra are piceous and the prosternal sutures feeble and indistinct.

B. apicalis n. sp.

Black, elytra piceous with the sides posteriorly and the apex gradually changing to yellowish-brown, legs and antennæ rufous. Head and prothorax densely finely granulato-reticulate and dull; elytra not reticulate, moderately shining, abdomen very finely feebly reticulate and quite strongly shining. Antennæ moderately incrassate, joints 2–3–4 gradually shorter, the second slightly thicker than the third and about one-third longer, fifth barely as wide as long, sixth a little transverse, tenth one-third wider than long, eleventh not quite as long as the two preceding. Head distinctly but not deeply or closely punctate posteriorly, vertex not evidently tuberculate, occipital fovea small; frontal suture fine, slightly impressed, epistomal margin finely tuberculate each side; eyes strongly prominent. Prothorax a little wider than the head, rather strongly transverse, sides parallel and distinctly arcuate in apical three-fifths, then covergent and rather strongly sinuate to base, the base angles a little obtuse, with narrowly rounded vertices, apical angles quite sharply defined; dorsal line fine, feebly impressed, subobsolete for a short distance at its extremities; punctuation fine, moderately close. Elytra about as long as wide, at base evidently wider than the prothorox, sides diverging a little to apex, rather densely finely punctate. Abdomen finely sparsely punctate above, beneath more closely and less finely so. Hypomera narrow, feebly impressed along the outer margin, a little narrowed at the coxal fissures, where the width is only about one-third the distance to the coxæ; fissures long and widely open. Mentum large, broadly feebly impressed longitudinally, the impression not deeper posteriorly. Length 5 mm.

California (Raymond). Four examples collected by Dr. Fenyes.

Allied to *ruficornis*, but larger and broader, the anterior thoracic angles more prominent and the antennæ less dark externally, the mentum nearly flat. In *ruficornis* the seventh ventral is produced at middle as usual in a more or less pointed cuspiform lobe; in *apicalis* the lobe is rather widely truncato-emarginate.

B. fratellus n. sp.

Very similar to *ruficornis*, differing as follows:

The size is uniformly smaller, the length varying from 3

to 3.3 mm. in the seven specimens at hand. The head and prothorax are densely granulato-reticulate, but more finely so and less dull than in *ruficornis;* the elytra piceous, becoming narrowly and rather abruptly yellowish-brown at apex. The outer joints of the antennæ are more strongly transverse, the tenth very nearly twice as wide as long.

California, Pasadena (type); Cole. Siskiyou County (Dr. Fenyes).

Adustus Csy., from Colorado, must be much like the present series, but according to description is more lightly and sparsely punctate.

B. medialis n. sp.

Black, elytra yellow with a broad fuscous sutural stripe; abdomen black above, rufopiceous beneath, legs yellow. Antennæ brown, paler at base, second joint slightly thicker than and barely as long as the next two, tenth two-thirds wider than long, eleventh nearly as long as the two preceding. Head and prothorax finely granulate and feebly shining, elytra and abdomen shining, the latter very feebly reticulate. Head evenly convex, epistomal suture very fine, not impressed, surface with a few scattered indistinct punctures and a small punctiform occipital fovea. Prothorax slightly wider than the head and a little wider than long, sides feebly arcuate, subparallel or a little divergent from the apex to the middle, then rounded, convergent and a little sinuate to base angles, the latter obtuse but well defined; front angles very narrowly rounded and nearly rectangular; median impressed line fine, entire; punctuation fine and rather sparse. Elytra a little wider at base than the prothorax, about as long as wide, very slightly wider apically, rather closely and moderately strongly punctate. Abdomen very finely and remotely punctate above, less sparsely so beneath. Hypomera nearly flat, very feebly depressed, parallel scarcely more than one-half as wide as their distance from the coxæ; prosternal sutures represented by a fine but prominent raised line; coxal fissures open. Mentum broadly concave, with or without a deeper rounded median impression. Length 3.1–3.4 mm.

Vancouver Island. Three examples.

Most nearly allied to *suturalis*, in which, according to description the mentum is flat and the prothoracic epistoma concave. These differences are slight probably and may be entirely due to slight individual variations, or to lack of precise description. I have, however, compared with the type of *suturalis*, and judged the present species distinct, but find no notes as to the differential characters.

B. confinis n. sp.

Head black, prothorax brown, elytra pale yellowish testaceous, the sutural edge darker except toward the apex, abdomen brownish piceous with the tip gradually a little paler, legs and antennæ testaceous; surface rather dull, the abdomen more shining, antennæ short, penultimate joints rather strongly transverse, second slightly longer than the next two. Front evenly convex, epistomal suture very fine, not distinctly impressed; surface very finely sparsely punctate. Prothorax a little wider than the head, evidently transverse, sides parallel and broadly arcuate for three-fourths their length, then rather suddenly rounded and sinuately convergent to base, the base angles rounded and indistinct, the apical angles sharply defined and nearly rectangular; surface minutely sparsely punctate, median line fine, scarcely impressed. Elytra at base just visibly wider than the prothorax, two-thirds longer, sides slightly divergent, finely, feebly, not closely punctate. Abdomen minutely reticulate but shining, punctuation very fine and remote. Prosternal sutures obliterated, the hypomera wide, but little narrowed in front, at base twice as wide as the length of the coxal fissures, which are completely closed. Length 2.2 mm.

El Paso, Texas. A single female specimen taken by the writer.

The mentum is broadly concave, with an indefinite and feeble longitudinal sublinear impression at middle. This species is to be referred to the *cordatus* group, and differs from *basalis* by the smaller prothorax, which is sinuately narrowed behind, more ample elytra—which are entirely yellow—and differently sculptured mentum.

APLODERUS Steph.

The two following species belong to Casey's Group I., distinguished by the front coxal cavities being very large and extending to within a short distance of the lateral edge of the prothorax.

A. trinifer n. sp.

Head and abdomen black, the extreme apex of the latter paler, prothorax rufous or castaneus, elytra flavate with the scutellar region and outer apical angles more or less infuscate; legs and base of antennæ rufo-testaceous, joints 4–11 of the latter piceous or rufo-piceous. Head as wide as the prothorax, eyes moderately large, their length subequal to their distance from the nuchal constriction, tempora posteriorly as prominent as the eyes; basal joint of antennæ about as long as the next three. Prothorax widest and subangularly rounded at about the

apical third, thence convergent and nearly straight to the hind angles, which are very obtuse but somewhat defined; surface sculpture as uaual. Elytra not quite one-half longer, and at base just visibly wider than the prothorax, slightly wider behind, rather coarsely punctate. Abdomen sparsely punctate. Length 2.4–3. mm.

Male.—Sixth ventral segment not distinctly modified, the punctures but little finer and closer than on the preceding segment; seventh segment with a broad very short rounded lobe-like prominence at middle.

Female.—Head a little smaller than in the male, sixth ventral with the usual long and narrowly rounded median lobe.

Southern California—Pomona (type), Pasadena, Ojai.

Differs from the other members of this group by the simple sixth ventral of the male and the trimaculate elytra.

A. mimeticus n. sp.

Almost precisely similar in appearance to the preceding except that the elytra are uniformly flavate, and the size averages a little smaller. The sixth ventral of the male is flattened and rather densely punctate and pubescent at middle as in *linearis*, but the seventh is not in the least produced as it is in the latter species, which is also rather larger and normally darker in color. Length 2.–2.6 mm.

Pomona, California—six examples.

A. princeps Csy.

A male specimen in my collection from Tulare County, California, possesses exactly the remarkable sexual characters of this species as described by Casey; it is, however, entirely blackish, the elytra just perceptibly paler piceo-castaneous. The type is described as pale flavate, and is probably immature.

DELEASTER Er.

D. trimaculatus n. sp.

Similar to *concolor* in size and other characters, except as follows: Head blackish, prothorax and abdomen posteriorly more or less darker than the elytra, the latter with a scutellar spot and the apex—more broadly toward the sides—piceous. Antennæ more elongate, the outer joints longer, the tenth one-half wider than long; elytra slightly wider than long, very finely rather closely punctate, alutaceous and dull.

Cañon City, Colorado. Three examples.

In *concolor*, as represented by a Vancouver specimen in my collection, the color is nearly uniform throughout, the outer joints of the antennæ are but little longer than wide, elytra slightly longer than wide, less finely and closely punctate and more shining.

SCAPHIDIIDÆ.

BÆOCERA Er.

B. humeralis n. sp.

Rather narrowly oval, blackish, elytra gradually rufescent at apex, the humeri rufous; antennæ pale, the outer joints dusky; legs rufous; abdomen rufescent at extreme apex. Integuments highly polished, elytra remotely obsoletely punctulate, elsewhere impunctate. Antennæ subequal in length to the head and prothorax, joints 3, 4 and 6 subequal and about three times as long as wide; 5 slightly longer; 7–11 gradually wider and pubescent, 9 more abruptly wider when viewed on the compressed side; joints nearly symmetrical. Prothorax about $\frac{1}{3}$ wider than long, hind angles acute and a little deflexed. Scutellum rather large, transverse. Elytra $\frac{2}{3}$ longer than the prothorax and about $\frac{1}{5}$ longer than wide; basal stria entire but very fine exteriorly; humeral spot reaching half way to the suture, not very sharply defined. Mesepimera extending $\frac{2}{3}$ to the coxæ; metepisterna very narrow, punctures along the hind margin of the middle and hind coxæ small. Length, 1.7 mm.; width, 1 mm.

Tacoma, Wash. (type); Flagstaff, Arizona. This species seems most closely allied to *texana* in size, well developed scutellum, and entire basal stria of elytra. It differs distinctly in color, shorter mesepimera and finer post-coxal punctures.

SCAPHISOMA Leach.

S. dakotana n. sp.

Moderately robust, polished, piceo-castaneous, the elytra gradually varying from castaneous at base to rufous at apex; head, legs and under surface pale, the metasternum blackish. Antennæ fully as long as the head and prothorax; joint 3 triangular, slightly longer than wide; 4 twice as long as 3 and rather less than three times as long as wide; 5 as long as 3 and 4 together, and more than three times as long as wide; 6 about one-third longer than 5, evidently dilated internally and with erect pubescence. Prothorax one-half wider than long, minutely sparsely lightly punctulate. Scutellum distinct. Elytra about one-sixth wider than their sutural length, sutural stria strong, basal stria extending to the middle on one side and nearly to the

humeral umbone on the other; punctuation well defined and rather close, moderately coarse at apex, becoming finer basally. Mesepimera reaching two-fifths to coxæ; metasternum punctate at middle, smooth at sides; abdomen finely alutaceous apically, less evidently so and finely punctulate basally. Post-coxal plate of first ventral barely extending one-fourth the length of the segment. Legs very slender, basal joint of hind tarsus fully as long as the next two. Length 2.7 mm. to the end of the somewhat extended abdomen; width 1.4 mm.

Bismarck, N. Dak. (Wickham).

Closely related to *punctulata* by its unusually closely punctured elytra, but the latter species is rather more slender, black, the apical bead of the elytra only paler, the mesepimera extending three-fifths to coxæ, the metasternum more punctate at sides.

S. semiopaca n. sp.

Moderately broadly oval, piceous black, head, antennæ, legs and abdomen in great part rufous. Prothorax black, highly polished and impunctate; elytra diffusedly pale at base, the apex more distinctly narrowly so; surface minutely alutaceous and dull, with sparse minute punctures from which rise very fine hairs. Antennæ about as long as the head and prothorax, third joint slightly longer than wide, fourth and fifth subequal, each nearly three times as long as the third and fully four times as long as wide; sixth slightly longer than the fifth, but not quite as long as the seventh. Prothorax one-half wider than long, hind angles moderately produced. Scutellum small, equilateral. Elytra not quite as long as wide, basal stria wanting, the sutural stria merely turned outward a little at base. Beneath nearly impunctate, a few very minute punctures on the first ventral segment. Mesepimera extending two-fifths to the coxæ; post coxal plate of first ventral very short, extending less than one-third the length of the segment. Legs slender, basal joint of hind tarsus just visibly longer than the next two together. Length, 2.2 mm.; width, 1.4 mm.

Texas (Luling). A single example taken by the writer.

The minutely sculptured and dull elytra at once distinguish this species from any previously described.

S. ornata n. sp.

Black, elytra each with an antemedian subtriangular discal spot rufous, and the apical third or fourth paler; legs, antennæ, abdominal apex and middle of ventral surface pale. Antennæ about as long as the head and thorax, third joint triangular, as wide as long; fourth twice as long as the third or slightly more, fifth and sixth subequal in

length, as long as the third and fourth together, the fifth about five times as long as wide, sixth arcuately dilated internally; seventh longer, eighth shorter and narrower than adjacent joints. Prothorax two-thirds wider than long, minutely punctulate, hind angles acute and moderately produced. Scutellum minute, equilateral. Elytra rather numerously and distinctly punctate; sutural stria fine, not flexed outwardly at base. Beneath impunctate; mesepimera extending two-thirds to coxæ, metepisternal suture distinctly oblique; post coxal plates well developed, subparabolic in outline, that of the firsf ventral two-fifths as long as the segment, more oblique externally. Hind tarsi nearly or quite as long as the tibiæ, basal joint quite as long as the next two. Length, 1.5 mm.; width, .9 mm.

Mobile, Alabama. Eight examples very kindly given me by Mr. Löding.

According to Mr. Löding's labels specimens were taken in fungus on oak and under bark. This is quite the prettiest species of the genus, and the only one thus far known in our fauna with elytral maculation. The post-coxal plates are better developed than usual, but not more so than in *evanescens*, which it should follow in Casey's table.

S. terminata Melsh.

Opportunity is here taken to call attention to an erroneous statement in Casey's Revision of the Scaphidiidæ with regard to the antennal structure in this species. The sixth antennal joint is there said to be "distinctly longer than the third, fourth and fifth combined," whereas an examination of typical examples in the LeConte and Melsheimer collections show that the fifth and sixth joints are subequal, the latter much shorter than 3–5 united. The metasternum is also finely and sparsely punctate, and the length is 1.5 mm. instead of metasternum coarsely punctured and length 1.8 mm. as stated by Casey, who evidently had something quite different in hand. The true *terminata* will retain its position in the table next to *evanescens*, but just what differential characters should be given to separate these two I am now unable to say. In its strongly developed post-coxal plates and posteriorly very broad metepesterna with strongly oblique suture *evanescens* possesses two very unusual characters, and it is highly probable that it differs in one if not in both respects from *terminata*.

S. pusilla Lec.

Here again Casey is in error in stating that the post-coxal plates of the first ventral extend "much beyond the middle of the segment." Specimens from North Carolina, Virginia and Massachusetts in Mr. Blanchard's and my own collection agree in all essential characters with the LeConte types of *pusilla*, and like the type, all have the abdominal plates a little less than half as long as the basal segment, as is described of Casey's *dimidiata* from Rock Island. There can be no doubt of the identity of the latter with *pusilla*. The erection of a new genus—*Scaphiomicrus*—for this and other possibly distinct species of small size appears to me unnecessary.

S. apicale Horn.

The descriptions of this species and of *peninsularis* by Horn in the "Coleoptera of Baja California" are too brief to permit a very satisfactory comparison with the previously known species as arranged by Casey, whose descriptions are very carefully drawn, and whose work on this family is on the whole deserving of much praise. *Peninsularis* is unknown to me, but a specimen of *apicale* obtained some years ago from Mr. Fuchs enables me to add some details which will be of use to the student for comparative purposes. With the exception of the head and propleuræ the insect is finely punctulate throughout, the upper surface more closely so however. The head is very minutely and remotely punctulate, the propleuræ impunctate. The sides of the mesosternum are sparsely punctulate, and the ventral surface is distinctly alutaceous throughout, both very unusual characters. The antennal structure is in some respects unique. The third joint is triangular, as wide as long, fourth cylindrical, less than twice as long as wide and barely one-half longer than the third; fifth and sixth each nearly twice as long as the third and fourth together. The pubescence begins on the fifth joint, but this and the sixth are only slightly dilated internally; the seventh quite strongly asymmetric. Scutellum small, equilateral. Mesipimera reaching

just visibly more than half way to the coxæ; metepisternal suture straight and strongly oblique; post-coxal arcs of first ventral about one-fourth the length of the segment.

HISTERIDÆ.

HISTER.

H. temporalis n. sp.

Broadly oval, black, highly polished. Prothorax strongly narrowed in front, sides nearly straight, inner marginal stria entire, outer abbreviated at apical two-fifths, surface very remotely and minutely punctulate toward the sides. Elytra with four entire dorsal striæ, fifth wanting, sutural represented by a few subconfluent punctures just behind the middle; oblique humeral very fine, subhumeral entirely wanting. Pygidium and propygidium similarly rather coarsely, closely punctate, the latter narrowly smooth at base, the former more broadly smooth at apex. Prosternum finely bistriate, the striæ divergent at base, then parallel, their tips bent inward; mesosternum moderately emarginate in front. Anterior tibiæ with four small teeth, the apical one double. Length from the apical margin of the prothorax to the sutural angle 4.5 mm; width, 3.8 mm.

Arizona (Baboquivaria Mountains—Snow).

This species is by the prosternal striæ allied to *servus*, *indistinctus* and *defectus*. The two former have the outer thoracic stria entire. *Defectus* has the prosternal striæ divergent in front and the pygidium nearly smooth. All three are considerably smaller than the present species—3–3.5 mm.—according to Horn's measurements. This may perhaps be the form for which Dr. Sharp suggests the name *Comes* in the Biologia, but as his description is limited to the statement that it is larger than *servus*, and with no scutellar stria I can do no more than suggest the possible identity of the Mexican species with the one here described.

H. humilis n. sp.

Broadly oblong oval, black, shining, prothorax and elytra impunctate. Prothorax moderately narrowed in front, the sides continuous with those of the elytra, very broadly arcuate, outer stria abbreviated, apical, inner stria entire. Elytra with three entire striæ, the fourth apical, consisting of three or four disconnected punctures, fifth wanting, sutural extending from the apex to the basal fourth; subhumeral striæ absent. Propygidium and pygidium alutaceous and dull, moderately coarsely and closely punctate, the bottom of the punctures shining; pygidium smooth at apex. Anterior tibiæ rather feebly serratodentate. Length 3.5 mm.

Arizona (Cochise County).

Form and size of *militaris*, to which it is closely related. In the latter the elytra are in great part red, and the propygidium is less closely punctate.

H. gagates n. sp.

Broadly oblong oval, black, polished, prothorax and elytra very minutely and sparsely punctulate. Outer thoracic stria interrupted for a greater or less distance at middle. Elytra with all the dorsal striæ entire, the fifth slightly shorter, recurved and joining the sutural; no subhumeral stria. Propygidium moderately coarsely not densely punctate; pygidium more finely and less closely punctured. Length, 3–3.3 mm.; width, 2.6–2.8 mm.

Lake Tahoe, California (type); Spokane, Wash.

In the type the outer prothoracic stria reaches the apical third, and there is a very short detached basal stria; in the Spokane example the stria is narrowly interrupted behind the middle. This is a near ally of *americanus*, but is distinctly narrower and more oblong, the pygidium much more evidently punctate apically.

NITIDULIDÆ.

CARPOPHILUS Steph.

In his treatment of this genus in the "Biologia" Dr. Sharp has called attention to the presence in certain species of an oblique raised line cutting off the anterior angle of the metasternum. This line is really a backward production of the anterior marginal raised edge of the metasternum. In the greater number of our species the line is strictly marginal throughout, reaching the episternal suture at the anterior angles of the metasternum. In a few, *e. g.*, *yuccæ* and *tempestivus*, it arches backwards just within the angle; in *dimidiatus* and *floridanus* n. sp., the flexure is more evident; in *marginatus* and *antiquus* it leaves the front margin at a greater distance from the angle, and approaches the episternal suture at its anterior third; in *mutilatus* and *luridus* at the anterior two-fifths, and in *nitens* n. sp., at about the middle, the front angles of the metasternum being in this case very widely truncate. The corner of the metasternum

cut off by the oblique line seems always to be devoid of punctures.

A second character used by Sharp in grouping the Mexican species is the presence of a marginal fringe of short ciliæ at the sides of the prothorax and elytra. Four species of the Mexican fauna possess this character according to Sharp, viz.—*pallipennis*, *floralis*, *canescens* and *longiventris*. All of these but *canescens* occur within our faunal limits, and to these we may add *hemipterus*, *melanopterus* and two new species described in the present paper—*longus* and *rickseckeri*. In *longus* and *longiventris* the ciliation is quite conspicuous, in *hemipterus* and *pallipennis* distinctly less so, and in the others the fringe is so short that in old or ill-conditioned specimens it might not be at all apparent. It will be observed that all the above species are at least moderately large and convex, none of our smaller depressed forms showing any appreciable trace of the marginal hairs.

C. dimidiatus Fab.

As already indicated in the preceding remarks the anterior angles of the metasternum are distinctly less widely truncate by the raised line in this species than in *mutabilis* and *luridus*. This character seems to be a very constant one, and taken together with the recognized differences in size, color and sculpture demonstates to my satisfaction its specific distinctness. The metasternal line seems to be identical in position in *mutilatus* and *luridus*, and it is probable that we have been correct in regarding them as forms of a single species.

C. floridanus n. sp.

Closely similar to *dimidiatus* in size, form and most details of structure. Head, prothrox and elytra concolorous, brown; dorsal surface of abdomen and sometimes the metasternum darker. Punctuation a little finer throughout than in *dimidiatus*. Legs slightly stouter, the hind tibiæ of the male subcylindrical for a short distance at base, then rather abruptly widening, the inner outline arcuate.

Enterprise, Florida. Two ♂'s, one ♀.

This species doubtless passes in collections for *dimidiatus*, in which, however, the hind tibiæ of the male are gradually widened from the base, the inner margin straight.

C. longus n. sp.

Elongate, parallel, convex, feebly shining, brown, the head and propygidium somewhat darker, the elytra, legs and antennæ a little paler; pubescence of upper surface short and rather inconspicuous; sides of prothorax and elytra fimbriate with short close-set hairs. Head and prothorax densely punctate, elytra a little more finely and less densely so, the dorsal segments of the abdomen still less closely punctate though not sparsely so. Head fully $\frac{2}{3}$ as wide as the prothorax. Prothorax $\frac{4}{5}$ as long as wide, very little narrowed in front, sides nearly straight, hind angles rounded. Elytra with sutural length slightly shorter, and lateral length a little longer than their width; $\frac{1}{7}$ longer along the suture than the prothorax. Body beneath densely punctate anteriorly; abdomen somewhat less so. Additional anal segment of male inferior in position. Legs short and stout, differing very little in the sexes. Length, 4.4 mm.; width, 1.7 mm.

Santa Rita Mountains, Arizona. A single pair kindly given me by Mr. Schwarz.

In Horn's table this species would fall near *mutilatus*, but the large size, narrow, parallel, rather convex form give it an appearance which is quite different from any of our other species. The ciliæ of the lateral margins of the prothorax and elytra are longer than in any other of our species, except possibly *longiventris*.

C. longiventris Sharp.

Specimens which agree sufficiently well with Sharp's short description of this Mexican species have been taken in the Santa Rita Mountains of Arizona by Hubbard and Schwarz, and more recently by Prof. Snow. It is a stout convex species of the general type of *pallipennis*, but longer, fuscous, the antennæ, legs and vertex rufous, the elytra rufous with the suture narrowly at base, and a broad median stripe or cloud fuscous. Punctuation nearly as in *pallipennis;* supplementary anal segment of male vertical, produced, narrowed to apex, the tip rounded and polished; last ventral with an apical fovea, on each side of which is a transverse polished tuberculiform elevation. Tibiæ all stouter in the

male, those of the hind feet curved in a plane transverse to the body, their inner face denticulate. Pygidium of female a little concave longitudinally, the tip prolonged and pointed. Length about $3\frac{1}{2}$ mm. Sharp gives 4 mm.

C. ignobilis n. sp.

Moderately elongate oval, subdepressed, piceous, legs and antennæ rufous, club of latter a little darker; upper surface moderately shining, with recumbent fuscous pubescence; punctuation close and moderately coarse throughout, the punctures on the disk separated as a rule by less than their own diameters. Head $\frac{3}{5}$ as wide as the prothorax. Prothorax slightly more than $\frac{3}{5}$ as long as wide, the apical width equal to the length, sides broadly arcuate, just visibly rounded in at base, not sinuate before the base angles, which are rather sharply defined and somewhat obtuse; disk with a very narrow median impunctate line in basal half. Elytra just perceptibly wider than long, at sides $\frac{1}{2}$ longer than the prothorax, the sutural length about $\frac{7}{9}$ the lateral length. Pygidium and propygidium more finely punctate than the elytra. Beneath less shining and rather densely punctate, the abdomen less coarsely and closely so. Length, 3.5 mm.; width, 1.6 mm.

Santa Rita Mountains, Arizona.

A single female specimen sent by Prof. Snow is all I have seen of this species, which while quite surely disctinct from any of our described species, seems to possess no characters of special interest. It is apparently nearest *niger*, differing from that in its narrower form, narrower prothoracic side margins, and entire lack of pronotal impressions.

C. rickseckeri n. sp.

Rather broadly oblong oval, convex, sparsely pubescent, black or nearly so, elytra with a small basal pale spot within the humeri, legs rufous or rufo-piceous, antennæ rufous, the club piceous. Upper surface strongly shining, polished, without trace of alutaceous sculpture except feebly toward the sides and apex of the elytra. Above quite coarsely punctured, more coarsely and closely so toward the sides of the prothorax, more sparsely at the middle, where the punctures are separated by from one to two times their own diameters. Beneath less shining and rather densely punctate throughout. Head a little more than half as wide as the prothorax. Prothorax slightly more than one-half wider than long, arcuately narrowed in front, subparallel basally, not at all sinuate before the hind angles, which are not retracted, fairly well defined, a little obtuse. Elytra not apparently wider than the prothorax, $\frac{1}{5}$ wider than long, the lateral length about $\frac{1}{5}$

longer than the sutural and $\frac{1}{3}$ longer than the prothorax. Supplementary anal segment of the male inflexed, but visible from above; pygidium of female longitudinally impressed at sides. Thighs stout, tibiæ moderate, straight, the front ones widest. Length, 3.3–4. mm.; width, 1.6–1.9 mm.

San Diego, California. One ♂, seven ♀s.

Taken in decaying cactus by Mr. L. E. Ricksecker, to whom the species is dedicated in recognition of many favors.

C. nitens n. sp.

Oblong subovate, moderately convex, piceous brown, antennæ, legs and under surface paler. Above rather sparsely pubescent, strongly shining, without or with but the faintest trace of alutaceous sculpture. Head moderately punctate, more finely so in front. Prothorax fully $\frac{1}{3}$ wider than long, subparallel basally, sides arcuately narrowed in front, the apex $\frac{4}{5}$ as wide as the base, hind angles well defined and subrectangular as viewed from above, not appreciably retracted; punctuation moderately coarse and close, the punctures separated at middle by from one to two times their own diameters; closer and a little coarser laterally. Elytra scarcely wider than the prothorax, slightly wider than the sutural length, sides parallel for $\frac{3}{4}$ their length, then a little narrowed to apex; punctuation similar to that of the prothorax. Beneath rather densely punctate, the prosternum more coarsely, the abdomen more finely so than above. Tibiæ nearly straight and gradually widened apically, scarcely different in the sexes. Additional anal segment in the males inferior in position. Length, 3 mm.; width, 1.4 mm.

Five examples are before me, all taken at or near Mobile, Ala., by Mr. H. P. Löding.

By Horn's table this species would fall near *antiquus*, from which it differs in its uniform color, more convex form, longer pubescence, unmodified hind tibiæ of the male, and in several other details. *Nitens* does not agree very closely with any of the species described by Murray or in the "Biologia," though seemingly nearest to *ferrugineus* Murr., of Mexico. This latter, however, is said to have the head and thorax very lightly and sparingly punctate, posterior angles obtuse and scutellum scarcely punctate, none of which characters apply to *nitens*.

C. floralis Er.

Dr. Sharp believes this to be distinct from *pallipennis* Say, and observes that it has the sides of the elytra less distinctly

ciliate, thus forming a sort of transition between the ciliate and non-ciliate species. He says that it differ from *pallipennis* otherwise in having more definite punctuation of the elytra, and the pygidium of the female quite simple at the extremity, whereas in *pallipennis* it is prolonged, incrassate and somewhat reflexed. This structure of the pygidium in the female is very distinct in some specimens before me, and feeble or obsolete in others that appear to be equally good *pallipennis*, I am, therefore, undecided as to what signification to attach to these variations.

TROGOSITIDÆ.

A new genus seems to be necessary for an undescribed Californian species allied to *Nemosoma* and *Alindria*. These two genera are themselves mutually very closely related, differing only in the broader more conspicuously spinose tibiæ and relatively shorter tarsi of *Alindria*. The difference in the form of the eyes indicated in the "Classification" is barely detectable, and seems to me of even less weight than such superficial characters as the humeral pits and finer elytral sculpture of *Nemosoma*. The new genus certainly differs more from each of these than they differ from each other.

PSEUDALINDRIA new genus.

Elongate, cylindrical, head equal both in length and width to the prothorax; epistoma deeply triangularly emarginate and impressed at apex, the sides produced over the base of the mandibles; palpi as in *Nemosoma* and *Alindria*. Antennæ as in these genera, except that the club is wider and less asymmetric, being distinctly developed interiorly, though less so than exteriorly. Eyes broadly transversely oval, not at all emarginate. Elytra without basal pits, not striate, the punctures confusedly distributed, with traces of serial arrangement near the suture. Tibiæ rather slender, the two anterior pairs with two or three small distant spines on the outer margin; front tibiæ with a rather slender curved apical spur; middle and hind tibiæ without distinct spurs; tarsi slender, as long as the tibiæ, last joint shorter than the three preceding united.

P. fissiceps n. sp.

Form narrow, cylindrical, moderately shining, black, prothorax and basal third of elytra, antennæ and legs reddish-brown; beneath blackish. Antennæ shorter than the head, basal joint longer, joints 2–8 short, gradually wider externally, club subequal in length to the preceding six joints, and twice as wide as the 8th; 8th joint transversely oval. Head elongate, parallel behind the eyes, the latter small, not prominent, about as distant from the prothorax as from the front of the epistoma. Epistoma deeply triangularly emarginate and impressed, front with a longitudinal impressed line; surface alutaceous, and rather strongly not closely punctate, the punctures elongate. Prothorax subequal in length to and not wider than the head, obviously narrowed posteriorly, apex squarely truncate, base broadly arcuate, side margin fine, disk evenly convex, punctuation slightly finer than on the head. Elytra very slightly wider than the prothorax, fully $2\frac{1}{2}$ times as long as wide and about $\frac{1}{3}$ longer than the head and prothorax together; punctuation rather sparse, irregular, with traces of serial arrangement near the suture; disk without trace of striæ, a short rather deep linear impression on the declivity. Head and prosternum beneath coarsely sparsely punctate; metasternum and abdomen finely sparsely punctate. Length, 4.4–5.7 mm.; width, .95–1.2 mm.

I owe my specimens of this interesting species to Dr. E. C. Van Dyke, who took them flying on warm days in March about corded Douglas spruce logs at Forest Hill, Placer County, California.

NEMOSOMA Lat.

N. caviceps n. sp.

Similar in form and size to *cylindricum*, piceous, antennæ and legs rufous, extreme base of elytra obscurely rufescent near the humeri. Head broadly but distinctly transversely impressed posteriorly, front broadly concave. Elytra very finely punctate striate basally, the punctures becoming almost completely obsolete apically; abdomen nearly smooth, the punctures very fine and remote.

Huachuca Mountains, Arizona—9000 feet (type); Las Vegas Hot Springs, New Mexico (Barber and Schwarz).

In *cylindricum* the front is flat or very nearly so, the head scarcely impressed behind, the elytral striæ distinct to apex, the abdomen more closely and distinctly though finely punctate, the elytra usually with basal and apical rufous areas.

TENEBRIOIDES Pall.

T. tenuistriata n. sp.

Strongly depressed, intensely black above, surface alutaceous and only moderately shining; beneath black or blackish anteriorly, the abdomen piceous or piceo-castaneous, legs and antennæ rufo- to piceo-castaneous. Prothorax not quite one-half wider than long, sides rather widely margined, sinuate behind, hind angles rectangular, basal margin squarely truncate, punctuation as fine as in *castanea*. Elytra one-fourth wider than the prothorax, evidently widest at middle, strial punctures very fine, the striæ scarcely perceptiby impressed, intervals biseriately punctate. Length, 7–8 mm.; width, 2½–3 mm.

Described from a series of four examples taken by the writer at Las Vegas Hot Springs, New Mexico.

This species is one of the most distinct in our fauna, being approached by no other in the fineness of the elytral sculpture. The squarely truncate hind margin of the prothorax is also peculiar to it.

T. occidentalis n. sp.

This name is proposed for a species occurring commonly in the Southern Rocky Mountain region. It is most nearly allied to *corticalis* and *californica*, but appears to be distinct from both. As compared with *corticalis* it averages considerably larger, the prothorax is more widely margined at the sides and a little more coarsely punctate; the interstitial punctures of the elytra are also less fine, and the sides of the elytra are a trifle less straight and parallel. The color is almost never black, varying from castaneous to piceous, the prothorax often somewhat paler than the elytra. The resemblance to *californica* is quite as strong, but in the latter the form is a little stouter, the elytra a little less elongate, the prothorax is also less widely margined, and the eighth antennal joint is subtriangular and a little wider than the seventh, while in *occidentalis* it is oval and not at all wider than the seventh. Length, 7–9.2 mm.; width, 2.6–3.3 mm.

Specimens are before me from Boulder, Colorado; Las Vegas Hot Springs, Pecos and Cloudcroft (type), New Mexico; and Williams and Chiricahua Mountains, Arizona.

T. debilis n. sp.

Strongly depressed, piceous above or with the head, or head and prothorax, castaneous; beneath rufo-castaneous. Antennæ about as

long as the head, eighth joint not wider than and similar to the seventh. Head and prothorax coarsely closely punctate, the latter strongly narrowed behind, the side margin narrow, evidently but briefly sinuate at the hind angles, which are well developed though small and nearly rectangular. Elytra narrowly oval, widest at middle, striæ well impressed, intervals rather strongly biseriately punctate. Length, 5.1–5.3 mm.; width, 1.9 mm.

Described from two examples, the type taken by myself at El Paso, Texas; the other from Texas without specific locality.

This species is nearest *marginata* and was so named for me years ago. Specimens of the latter species from Ohio in the LeConte Collection, with which I have made comparison, differ in being black with sides of elytra rufous, head and prothorax less coarsely closely punctate, the latter less narrowed behind, the angles a little less prominent, the elytra more parallel. *Collaris* is of the same size and general appearance but is still more flattened, with the prothorax even more finely margined, and the hind angles scarcely defined.

T. californica Horn.

This species is quite distinct from *sinuata* with which it has been united as a variety in the Check List. The lattter has the prothorax less narrowed behind than usual and more widely margined than in *californica*.

ELATERIDÆ.

LIMONIUS Esch.

L. vernalis n. sp.

Head and thorax aeneopiceous, margins, except sometimes the lateral ones, more or less marrowly pale; elytra reddish-brown, beneath piceous, the prosternal lobe, sutures and side margins, and the abdominal apex more or less pale. Antennæ longer than the head and prothorax by about two joints (♂), or about reaching the hind angles of the thorax (♀); joints 2–3–4 gradually longer, the third scarcely wider than the second; fourth wider, triangular, nearly one-half longer than wide; following joints gradually narrower but scarcely longer than the fourth. Head rather coarsely punctate, front flattened or feebly concave, margin feebly sinuate at middle. Prothorax slightly longer than wide, widest behind the middle, sides broadly arcuate and gradually a little convergent from about the basal third, not sinuate before the

hind angles, which are parallel and not produced; disk strongly moderately coarsely punctate, the punctures nearly in contact at sides, slightly finer and distant by their own diameters—more or less—at middle; median line impressed posteriorly. Elytra parallel in basal two-thirds, finely striate, striæ distinctly punctate, intervals subbiseriately punctate. Beneath a little more finely and less closely punctate. Basal joint of tarsi a little longer than the second. Length, 8.3–10 mm.; width, 2.1–2.7 mm.

Southern California—Pasadena (type), Pomona, Claremont, Riverside, Santa Monica. Specimens from Healdsburg and Russian River in Northern California seem scarcely different, and are so referred.

This species is the commonest one of the genus in Southern California, appearing on willows in early spring. It resembles in a general way several Californian species. Of these *infuscatus* differs in having shorter antennæ, the joints relatively a little less elongate, the prothorax uniformly æneo-piceous and more finely punctate, and the elytra of a darker tint; *discoideus* has the pale side margins of the prothorax wider and is more coarsely densely punctate; *occidentalis* has the prothorax entirely piceous, and also much more coarsely densely punctate; *canus* is more coarsely sculptured, darker in color, and with longer antennæ.

ATHOUS Esch.

A. aterrimus n. sp.

Intense black throughout, dull, pubescence fine, fuscous. Antennæ as long as the prothorax, second joint half as long as the third, third broadly triangular, a little narrower and shorter than the fourth, fourth and fifth equal, broadly triangular, a little longer than wide; following joints gradually narrower. Head densely punctate, strongly subtriangularly impressed. Prothorax slightly longer than wide, gradually narrowed from the base, sides scarcely at all sinuate posteriorly, broadly arcuate, hind angles short and blunt, not produced, rounded at tip and not divergent; punctuation very dense throughout, median line with trace of impression in certain lights, hind angles with a fine but strong, moderately long acute carina. Elytra not much more than twice as long as the prothorax, very feebly narrowed from the base for two-thirds their length, then more rapidly so to apex, striæ moderate, intervals rather densely punctate. Beneath more shining, pubescence paler, rather closely finely punctate, the propleuræ more densely so. Basal joint of hind tarsi as long as the next three, joints 1–4 all with a short lobe, the lobes of the second and third a little more developed. Length, 10.5 mm.; width, 3 mm.

McCloud, Northern California (Fenyes).

A single example of uncertain sex is all I have seen of this species, which is not at all like any other of the genus known to me. The general aspect is like that of *Megapenthes tartaricus*, though less coarsely sculptured and less pubescent.

A. ingens n. sp.

Black, shining, pubescence blackish, very fine and short, sparse and inconspicuous. Antennæ (♂) passing the hind angles of the thorax by a little less than the length of the last joint; (♀) failing to reach the hind angles by about two joints; second joint one-half as long and slightly more than half as wide as the third, the latter a little shorter and narrower than the fourth, which is a little longer than wide; outer joints gradually narrower and more parallel, the tenth about twice as long as wide. Head closely punctate, front rather strongly concave, the concavity subtriangular in some specimens. Prothorax not quite as long as wide, a little narrowed in front, sides broadly arcuate, hind angles scarcely divergent; punctuation dense and rather coarse laterally, finer and less close medially, a short, narrow, imperfect smooth line at middle; median line impressed posteriorly, hind angles with a fine short carina. Elytra not much wider than the prothorax and nearly three times as long, subparallel in the male, a little dilated posteriorly in the female; striæ moderately impressed, finely punctate apically, more strongly so basally; intervals feebly convex, finely sparsely punctate. Prosternum closely rather coarsely punctate, the flanks fully as coarsely and more densely punctate; metasternum and abdomen more finely and sparsely punctured. Basal joint of hind tarsus as long as the next three; joints 2–3–4 with short lobes. Length, 16 mm.; width, 4.7 mm.

Five specimens have been seen, all collected by Dr. Fenyes at Mohawk, California. It is probably most nearly allied to *scissus*, but may be separated by its larger size and carinate hind angles of the thorax.

A. imitans n. sp.

Elongate convex, moderately shining and pubescent, head and prothorax piceous, the hind angles of the latter pale, elytra rufotestaceous, beneath piceous, the legs, prosternal lobe, and sometimes the abdominal apex, pale. Antennæ brown or piceous, paler at base, short, not or scarcely attaining the hind angles of the prothorax, joints 2–3 subequal in width, the latter but little longer; fourth distinctly wider and about one-third longer than the third, triangular, three-fourths as wide as long, the lower apical angle obtuse and rounded; fifth similar

to the fourth, following joints gradually narrower, the eleventh only slightly longer than the tenth. Head flattened in front and feebly broadly concave, the apical margin not or but little reflexed, densely punctate. Prothorax a little longer than wide, sides feebly arcuate, a little narrowed in front, not sinuate posteriorly, the hind angle not produced, rectangular; surface densely, nearly evenly, not coarsely punctate, median line vaguely impressed, hind angles not carinate. Elytra very little wider than the prothorax and two and one-half times as long as wide, finely striate, intervals nearly flat, closely punctate. Beneath rather densely not coarsely punctate, the prosternum somewhat less closely punctate. First joint of hind tarsus not quite as long as the three following; tarsal joints without lobes. Length, 8.5–10.5 mm.; width, 2.3–2.9 mm.

Placer County, California (G. R. Pilate).

The pubescence is pale throughout, rather closely recumbent with sparsely dispersed longer more erect hairs both above and beneath, most noticeable on the pronotum, where, however, they are only evident when viewed in profile. This peculiarity of the pubescence is observable in a few other species of *Athous*, notably in *discors* and *agriotoides*, the latter of which very closely resembles the present species. In *agriotoides* the pubescence is longer throughout, the prothorax more coarsely punctate, the second antennal joint only half the length of the third, the latter nearly as long as the fourth, and the third tarsal joint is conspicuously lobed.

CORYMBITES Lat.

C. linearis n. sp.

Very narrow, rather feebly shining, sparsely pubescent, prothorax rufotestaceous with the side margin and a broad median longitudinal vitta fuscous, elytra yellow with side margin and broad sutural stripe dark brown; beneath rufotestaceous, the sterna more or less completely infuscate; prosternum yellow in front, the tip of the lobe dark. Antennæ brown, slender, half as long as the body, the seventh joint reaching the hind angles of the prothorax (♂), second joint short, nearly as wide as long and scarcely half as long as the third, the latter elongate triangular, a little more than twice as long as wide, the apical angle obtuse; fourth joint slightly longer than the third, the following joints becoming gradually longer, 6–11 parallel, the tenth at least four times as long as wide. Head densely coarsely punctate and feebly concave. Prothorax much longer than wide, apex not wider than the head, sides straight and gradually divergent to base angles, a faint sinuation before the latter, which are, however, scarcely diver-

gent and not produced ; surface coarsely densely punctate throughout, except for a very narrow, incomplete and imperfect smooth median line ; hind angles with a moderately long and fine carina near the side margin. Elytra three times as long as the prothorax and three and one-half times as long as wide, widest at the humeri, thence gradually attenuate to apex ; striæ well marked, finely punctate near the suture, more coarsely so laterally ; intervals somewhat convex and biseriately punctate, the punctures close to those of the striaæ. Beneath finely rather densely punctate posteriorly, the prosternum more coarsely so. Length, 13–14 mm. ; width, 2.9–3.1 mm.

California.

Described from two male specimens given me years ago by Mr. L. E. Ricksecker, and probably taken by him in the vicinity of Santa Rosa.

Linearis is rather strongly suggestive of the Eastern *longicornis*, which has still longer antennæ, with the second joint shorter, the prothorax less densely punctate, more shining and not vittate.

C. macer n. sp.

Strongly elongate, brown, the pronotum, prosternum and median parts of the abdomen piceous; surface shining, pubescence short, grayish, rather sparse. Antennæ three-fourths as long as the body, the seventh joint reaching the humeral umbone, second joint small, a little wider than long and scarcely one-third the length of the third, the latter triangular, twice as long as wide, the apical angle nearly right ; following joints gradually longer and less triangular, 7–11 linear. Head densely punctate, front broadly concave. Prothorax at apex not wider than the head, sides gradually divergent and nearly straight throughout, hind angles not produced or divergent, the width across the hind angles not quite three-fourths of the length along the median line ; punctuation rather coarse, dense laterally, a little less so medially, but with no indication of a smooth line ; hind angles carinate. Elytra three and one-fourth times as long as wide, striæ rather fine, intervals slightly convex, biseriately punctate apically, the punctures becoming more numerous and irregular basally. Body beneath finely closely punctate, the prosternum more coarsely so at middle. Length, 15 mm. ; width, 3.6 mm.

Miami, California ; June, Dr. Fenyes.

Nearly as elongate as *longicornis* and *linearis*, and allied to them by the unusually long antennæ, which are, however, not quite as long as in *longicornis*, though longer than in *linearis*, but differs from both in color.

C. rufipennis n. sp.

Black, elytra red, propleuræ piceous at middle, paler in front and behind; femora piceous, tibiæ and tarsi paler. Antennæ passing the hind angles of the thorax by about two joints, moderately serrate basally, second joint just visibly longer than wide, and about one-half the length of the third, the third not quite twice as long as wide, subequal to the fourth, the latter about one-third longer than wide, tenth twice as long as wide. Head vaguely concave, not very densely punctate. Prothorax evidently longer than wide, sides broadly arcuate and moderately convergent in front, a little sinuate before the hind angles, which are moderately divergent; punctuation coarse and dense laterally, finer and less close medially, where the punctures are separated by about their own diameters; disk broadly impressed at sides near the middle, hind angles carinate. Elytra parallel in basal three-fifths, striæ moderate, finely punctate, intervals nearly flat toward the suture, feebly convex laterally, finely not very numerously punctate. Beneath finely densely punctate, the prosternum more coarsely so. Length, 11 mm.; width, 3.2 mm.

Kaweah, California, June 5th, 7400 feet. One specimen, probably a male, received from Mr. Ralph Hopping. This species resembles and is perhaps nearest *spinosus;* it is, however, a little narrower, the thorax more coarsely punctate, the antennæ stouter and the elytra of a brighter tint.

C. lutescens n. sp.

Testaceous, prothorax brownish, head darker; beneath brownish, the abdominal apex more or less paler; pubescence fine and short, pale. Antennæ piceous or brown, the basal joint pale, in the male passing the hind angles of the prothorax by about two joints; joints 2–3–4 gradually longer (♂), the fourth barely twice as long as wide and distinctly shorter than the second and third together. Head moderately coarsely closely punctate. Prothorax, exclusive of the hind angles, nearly square, sides subparallel, narrowed a little in front, hind angles prolonged, acute, and rather strongly divergent; disk finely not very closely punctate, median line not impressed, hind angles with a fine short carina. Elytra about two and two-thirds times as long as wide, sides nearly parallel, striæ fine, very finely punctate, intervals rather closely confusedly punctate. Beneath finely rather sparsely punctate, the propleuræ more densely so. Length (♂), 9.2 mm.; width, 2.5 mm.; (♀) length, 10.2 mm.; width, 3.6 mm.

The male type above described was taken at Bannf, Alberta, by Dr. Fenyes. I have associated with it with confidence several females from Emerald Lake, B. C., also collected by Fenyes. The females are notably stouter, the pro-

thorax wider and more rounded at sides, the elytra inflated posteriorly, the antennæ barely as long as the thorax, the fourth joint just visibly longer than the third; the prothorax and lower surface paler than in the male, the elytral striæ very fine and not impressed on the disk basally.

This species seems nearest *insidiosa*, from which it differs by the less elongate prothorax and shorter antennæ. In *insidiosa* (♂) the fourth antennal joint is nearly twice as long as the third and equal in length to the second and third together. *Sagitticollis* is also similar in general form and facies, but is a larger species, and in the male the second and third joints of the antennæ are short, together not longer than the fourth.

C. nigricans n. sp.

Moderately elongate, shining black, the elytra piceous black, legs and antennæ rufopiceous, pubescence very fine dark and inconspicuous. Antennæ short and stout, not reaching the base of the prothorax; second joint a little more than half as long as the third, third and fourth subequal in length, the latter a trifle wider and not quite twice as long as wide; fifth distinctly shorter than the fourth, the following joints gradually shorter, the tenth nearly as wide as long. Front flattened, the impression distinctly triangular in one specimen, punctuation moderate. Prothorax subquadrate, as wide at middle as the apices of the hind angles, sides broadly arcuate, not very strongly narrowed in front, sinuate behind, hind angles moderately divergent and acute, strongly carinate; punctuation rather dense but not coarse, not closer at sides, median line impressed throughout. Elytra very little wider than the prothorax, striæ finely punctate, intervals very finely irregularly not densely punctate, there being four to five punctures in the width of the interval. Beneath sparsely finely punctate, the propleuræ a little more closely and coarsely. Length, 11.5–12 mm.; width, 3.4–3.5 mm.

California, Lake Tahoe (type) and Siskiyou County.

The antennal structure and to a considerable extent the general form is suggestive of *sulcicollis*, near which the species may be placed. In *sulcicollis* the prothorax is longer and widest at a point much farther forward.

C. exclamationis n. sp.

Obovate, depressed, shining, finely pubescent, black, elytra yellow, each with a small subbasal spot, and behind this an obliquely arcuate

longitudinal vitta at the middle third approaching the suture posteriorly, black. Antennæ barely reaching the hind angles of the prothorax, nearly as in *hieroglyphicus* and allies, the third joint a little wider apically, but not distinctly triangular, barely as long as the fourth. Head small, scarcely half as wide as the prothorax; front flat, not closely punctate. Prothorax as long as wide, widest at base, the hind angles moderately strongly divergent, sides arcuately and rather strongly narrowed anteriorly, surface finely closely punctate, hind angles not carinate. Elytra strongly widening to apical third, where they are one-third wider than the prothorax, three-fourths longer than wide, side margins rather broadly reflexed, striæ almost obliterated except at base, the rows of punctures just discernible with a good lens. Beneath finely closely punctate and pubescent. Length, 8.8–9.6 mm.; width, 3.2–3.6 mm.

Described from a series of five specimens taken by Dr. Fenyes near Lake Tahoe, California.

A very pretty species related to *nigricollis*, *hieroglyphicus*, etc., but at once distinguishable by the elytral markings and the nearly obliterated striæ. The elytral vitta reaches the suture and extends forward a short distance along it in one specimen.

C. polygenus n. sp.

Form rather narrow, parallel, reddish-brown, pubescence conspicuous, pale ochreous in color. Antennæ barely passing the hind angles of the prothorax, joints 2–3 short, subequal, together a little longer than the fouth, 4–10 triangular, the fourth about one-third longer than wide, following joints very gradually becoming a little narrower and shorter, the tenth scarcely twice as long as wide, the eleventh about two and one-half times as long as wide. Head and prothorax rather closely pubescent, the former broadly concave, margin of front arcuate, not reflexed, closely rather coarsely punctate. Prothorax very little longer than wide, sides nearly parallel, feebly narrowed near the apex, hind angles short, not divergent and not evidently carinate. punctuation rather coarse, deep, and dense throughout; disk flattened along the median line in front, and evidently impressed posteriorly. Elytra parallel in basal two-thirds, striæ rather strongly punctate, intervals nearly flat on the disk, each with a series of fine punctures each side, with more distant ones along the middle. Prosternum closely rather coarsely punctate, the flanks easily so; prosternal sutures single; metasternum more finely less densely punctate, the abdomen finely rather sparsely punctured. Basal joint of tarsi subequal to the next two, the third joint with a feeble apical lobe. Length, 10.5 mm.; width, 3.2 mm.

Sylvania, California (Ricksecker).

This species looks more like an *Athous* than a *Corymbites*, and the incipient lobe of the third tarsal joint would bear out the resemblance; the frontal characters, however, are those of *Corymbites*, and since the latter genus is already strongly polymorphic, it seems better for the present to include the species here.

PLASTOCERUS Lec.

Males of this genus are not uncommonly taken in Southern California, either in flight at dusk or by beating or sweeping. So far as I know no female specimens have ever been taken, and their form is purely conjectural, though they might reasonably be expected to resemble those of the allied genera *Aplastus* and *Euthysanius*. The placing of *P. frater* Lec., as the female of *Schaumii* by Dr. Horn is an error for which there seems little excuse. LeConte expressly states that his unique type of *frater* is a male, which declaration is easily verifiable, the genitalia being plainly visible. *Frater* is at once separable from our other Plastoceri by the relatively short, almost non-ciliate antennal rami, these being about half as long as the width of the front, while in all others the rami are very nearly equal in length to the frontal width. With *frater* removed there remains in my collection a very perplexing array of specimens, in which several species seem indicated, but in which, after the separation of one well characterized form, I am unable to draw further lines of distinction with any exactness. The form and punctuation of the prothorax varies so much individually as to be of no use in separation of species, and many other differences which are obvious when two individuals are compared become evanescent or even reversed when more specimens are examined. For the present, therefore, it is best to consider all these varieties as forms of *Schaumii*. The typical *Schaumii* comes from San Diego in the immediate vicinity of the coast. It is dark piceous brown in color, the eyes relatively small and less prominent than in other forms, their width as seen from the front less than one-fourth the frontal width; the elytra about three times as long as wide.

The most notable variations from the typical form occur in color, which is often paler, the larger eyes and the shorter elytra, which may be more narrowed apically. The following is a very distinct species.

P. megalops n. sp.

Reddish-brown, form strongly elongate, elytra nearly parallel, about three and one-fourth times as long as wide; pubescence very short; eyes very large and prominent, their width, viewed from the front, fully two-fifths the interocular width. Length, 12–13 mm.; width, 2.8–3 mm.

Pomona, California.

The above characteristics are sufficient and perfectly distinctive. The prothorax varies as usual in form, the sides either straight or more or less dilated at middle; the punctuation variable but never very coarse or dense. The hind angles are always strongly divergent.

Numerous specimens have been taken in years past, and have been sent to correspondents as *Schaumii*. I have never seen it from any other locality, and suspect it to be very local or restricted in distribution.

BUPRESTIDÆ.

POLYCESTA Sol.

P. obtusa Lec.

The type has a dense brush of yellowish hair on the first ventral segment, indicating that it is really *angulosa* and not *velasco* as recorded in synonymy. The first ventral segment is scarcely or but slightly swollen and is as densely punctate as the other segments.

AGRILUS Steph.

A. knausii Schf.

Typical specimens of this species were sent me by Mr. Knaus several years ago. They were at first thought to be new, but on comparison with the type of *obolinus* at Cambridge I came to the conclusion that they were not specifically different. Since Mr. Schaeffer's description of the species under the above name I have again compared my specimens with the LeConte type, and see no reason to reverse my first decision. The diagnosis of *obolinus* as given by Horn in his

Synopsis of the genus is erroneous in several important particulars. He describes the thorax as without strigosity, the hind angles without trace of carina and the elytral apices not serrulate, none of which statements are correct. In these respects *knausii* is in accord with the type, and the only differences noted aside from color were the apparently somewhat shorter antennæ and the slightly better marked carina of the hind angles of the prothorax in the latter.

LAMPYRIDÆ.

PLATEROS Bourg.

P. roseimargo n. sp.

Slender, nearly four times as long as wide, black, sides of prothorax rather widely, apex more narrowly margined with rose red. Antennæ (♂) feebly serrate, nearly half as long as the body; third joint triangular, as wide as long, about three-fifths as long as the fourth and quite as wide; fourth about twice as long as wide. Prothorax a little more than two-thirds as long as wide, widest at base, sides feebly convergent for a short distance from base, then more strongly so, sinuate each side of the rather narrowly rounded apex; median line not carinate in front, channeled behind. Elytra five times as long as the prothorax, reticulation rather fine but distinct; costaæ fine, the alternate ones just visibly more prominent. Length, 6 mm.; width, 1.6 mm.

Santa Rita Mountains, Arizona. One ♂, collected by Prof. Snow.

P. coccinicollis n. sp.

Black, prothorax bright rose scarlet, with or without a small posteromedian black spot. Antennæ (♀) as long as half the body, third joint triangular, slightly wider than long, nearly or quite equal in width to the fourth joint, the latter oblong, narrowed at base, one-half longer than wide and nearly twice as long as the third; fifth joint similar to but slightly shorter than the fourth, following joints subequal in length to the fifth and gradually narrower. Prothorax seven-tenths as long as wide, sides nearly parallel basally, broadly evenly arcuate around the front, the outline only very slightly more prominent at apex; median line feebly subcarinate in front, impressed posteriorly; margins moderately reflexed. Elytra nearly three and one-half times as long as the prothorax, feebly rather indistinctly reticulate, the costæ fine and equal. Length, 7¼ mm.; width, 2¼ mm.

Described from three female specimens taken at Beulah, New Mexico (type), and Boulder, Colorado. At once separable from all our previously described species except the

Lower California *Sanguinicollis*, by the bright red prothorax. *Sanguinicollis* is a smaller species (5 mm.), with prothorax more narrowly rounded apically, and with the third antennal joint but little shorter than the fourth (♂).

MALACHIDÆ.

COLLOPS Er.

C. crusoe n. sp.

Male. Head rufous, a small spot in front of the eye and the under surface blackish; prothorax rufous, elytra yellow, each with an elongate dark blue basal spot and a much larger one occupying the greater portion of the posterior half, the entire limb and suture pale; antennæ rufous; legs black, front and middle trochanters, the anterior tibiæ and all the tarsi rufous, middle tibiæ dusky; metasternum and abdomen in great part black, the apical segment of the latter largely pale. Upper surface dull throughout, with very short sparse black erect hairs, and still shorter very inconspicuous pale hairs. Basal joint of antennæ sinuate posteriorly, second a little longer than wide, following joints feebly serrate and a little wider than long, the outer ones as long as wide. Head finely closely punctate. Prothorax two-fifths wider than long, sides strongly rounded posteriorly, becoming nearly straight and feebly convergent in front, surface densely but vaguely, rather coarsely, subrugosely punctate. Elytra coarsely, densely punctate, narrow at base, broader behind, wings rudimentary.

Female. Differs from the male only in its larger size, unmodified second antennal joint, head black at sides, prothorax more rounded in front, and all the tibiæ pale. Length (head deflexed) 3–4½ mm.

Described from a single pair given me by Mr. V. W. Owen of Los Angeles. They with others were taken on the little Island of San Nicholas off the coast of Southern California.

This is a very pretty species with its pale rufous head and prothorax, and bright yellow elytra maculate with deep blue. It is doubtless a truly insular form, and with the exception of *cribrosus* differs from all our other species in being apterous. It agrees with *cribrosus*, *pulchellus* and *argutus* in the posteriorly sinuate basal joint of the antennæ.

C. flavicinctus n. sp.

Above clothed rather conspicuously with short recurved and sparser long erect pale hairs. Head pale yellowish testaceous in front, black back of a line joining the middle of the eyes; prothorax black with very narrow pale side margins; elytra blue-black, narrowly margined throughout with pale yellow. Antennæ pale yellow, the outer angles

of the intermediate joints slightly infuscate; second joint a little longer than wide and as long as the next two; following joints transverse. Head finely alutaceous and sparsely finely punctate. Prothorax moderately transverse, sides rather strongly rounded, surface strongly shining, finely sparsely punctate. Elytra subalutaceous, feebly shining, surface a little uneven, somewhat indistinctly finely rather sparsely punctate. All the trochanters and the posterior legs black, femora and tibiæ of the front and middle legs rufotestaceous, their tarsi blackish. Body beneath black, the margins of the ventral segment narrowly pale yellow. Length 3.5 mm.

San Bernardino Ranch, Douglas, Ariz.—3750 feet (Snow). A single female specimen.

By Horn's table this species would be associated with *punctulatus* and *vittatus*. The elytra are less distinctly alutaceous than in the former, and much more finely sparsely punctate than in the latter; it differs conspicuously from both in having the erect hairs entirely pale in color.

C. georgianus n. sp.

Male. Entirely pale rufous except the elytra, which are greenish-black with the side margins and suture, except at apex, narrowly rufous; apices of antennal joints slightly dusky. Pubescence dual as usual, the short recurved hairs pale, the erect hairs sparse, short, black. Basal joint of antennæ very broadly triangular, nearly as wide as long, second joint much wider than long, 3–5 about as long as wide, following joints evidently longer than wide. Head very densely finely punctate and dull. Prothorax moderately transverse, sides nearly straight and very slightly convergent in middle four-fifths, surface finely alutaceous and finely moderately closely punctate at middle, more closely and less finely so at sides. Elytra densely punctate and rather dull.

Female. Differs only in having the basal joint of the antennæ more slender, the second simple, about as long as the first, two-thirds longer than wide; prothorax more rounded at sides. Length 4–4.5 mm.

Georgia.

A single pair recived years ago as *limbellus*, which indeed it would be by Horn's table, but the latter has the head and prothorax polished and very sparsely minutely punctate, the elytra less closely punctate and moderately shining, the antennæ very strongly serrate, the intermediate joints very strongly transverse.

MALACHIUS Fab.

M. uniformis, new name ; = *inornatus* Fall.

At the time of describing this species I overlooked the fact that the name given was already in use for a Palearctic species ; the above change is therefore proposed.

M. spinipennis and **M. acutipennis.**

In addition to the antennal and elytral sexual characters, the males of these two species agree in possessing two other characters which are nearly peculiar. The inner face of the posterior femora is densely acutely granulose in its lower half for two-thirds its length from the base, and the posterior tibiæ are rather conspicuously pilose on the inner side for a short distance at apex, the hairs being quite short however. This latter character is feebly indicated in the males of some other species of the genus. *M. spinipennis* shows a decided tendency toward the formation of local races, specimens from different parts of California differing quite a little in size, color, extent of the thoracic spot and length of the antennal pectinations. It is quite possible that we have several closely allied species under this name.

The following three species seem surely different from any previously described.

M. contortus n. sp.

Rather stout, head, prothorax, under surface and legs bluish-black, the prothorax with a narrow pale margin, which is a little dilated at the posterior angles, and becomes obsolete or very narrow toward the middle of the base and apex; elytra deep blue, the tip yellow in the female. Pubescence very short, gray, surface lustre dull. Head and prothorax very finely alutaceous and finely punctulate, the latter feebly shining ; elytra scabrous and not distinctly punctate.

Male. Antennæ moderately serrate, joints 3 and 4 as wide as long, the following joints gradually narrower. Elytra impressed at the sutural angle and produced on a lower plane in a gradually narrowed process pale grayish testaceous in color, the tip sooty and narrowly rounded ; inferior plate broad, bidentate at tip and with an elongate and very irregular process attached at its base close to the sutural margin ; this process and the inferior plate projecting beyond the superior appendix and concolorous with it.

Female. Antennæ slightly shorter and distinctly narrower, feebly

serrate, all the joints longer than wide; elytral apex rounded, pale reddish yellow. Length 4–5 mm.

Bitter Root Mountains, Montana. Three ♂s; four ♀s.

In form, size, and sexual characters this species is almost precisely like *uniformis* (*vide* supra), the pale thoracic margin and the pale elytral apex of the female are, however, wanting in the latter.

M. viridulus n. sp.

Slender, slightly wider behind, more obviously so in the female, rather dark metallic green throughout, the elytra more rarely dark blue or blue-green; epistoma, antennal tubercles and genæ pale yellowish-white; pubescence sparse, rather long, grayish. Antennæ (♂) half the length of the body, rather strongly serrate, joints 3–5 about as long as wide, following joints a little longer than wide. Head and prothorax highly polished, very minutely remotely punctate. Prothorax a little transverse, sides feebly arcuate and moderately convergent in front, broadly rounded behind, without trace of base angles. Elytra moderately shining, surface a little irregular and subscabrous, punctuation somewhat coarse but vague, not very close; apices not at all appendiculate in the male. Length 3–4 mm.

Mt. Wilson, Southern California.

This species occurs abundantly on the flowers of *Ceanothus* on or near the summit of the Sierra Madre Mountains in June. It may be at once distinguished by its rather small size and entirely green color. Of the described species two only—*ænus* and *biguttulus*—agree with it in having serrate male antennæ and non-appendiculate elytra. The females of *viridulus* differ only in their slightly less parallel form, and shorter and narrower antennæ, the joints after the second all longer than wide.

M. bakeri n. sp.

Male. Form moderately elongate, parallel, black, faintly æneous, prothorax pale reddish-yellow with broad black median stripe, elytra with pale tip, legs black, hind tibiæ pale in apical two-thirds; pubescence pale, fine, sparse. Antennæ reaching the middle of the elytra, strongly pectinate, the branches of joints 3 and 4 about half as long as those of the following joints, those of 7 and 8 slightly longest and about one-half longer than the joints themselves. Head and prothorax strongly shining, the former sparsely punctulate, the latter transversely oval, broadly impunctate on the disk, a few fine punctures laterally. Elytra finely rugulose, vaguely finely punctate, sides slightly dilated

just before the obliquely narrowed apex, each with an impression just before the apex, the sutural angle minutely acuminate, inferior plate moderately projecting, rounded at tip, each bearing a slender acutely spiniform process arising from the base near the sutural edge, their tips in contact and attaining the level of the elytra. Hind tibiæ very slender throughout. Length 4.5 mm.

Claremont, California. A single male sent me by Prof. C. F. Baker, in whose honor it is named. The form of the elytral appendix is scarcely different from that in *mirandus*. The latter differs in color, in having the antennal branches longer, the intermediate ones nearly twice the length of the joints, and frequently dilated outwardly; the hind tibiæ very distinctly stouter in the male.

MELYRIDÆ.

DASYRHADUS new genus.

The two Californian species for which the above generic title is proposed are by their setose eyes and triangular terminal joint of the maxillary palpi related to *Rhadalus*. The small size and shorter vestiture is, however, much more suggestive of *Dasytes* and allies. The form is elongate, subdepressed, somewhat cuneiform, the prothorax very short and strongly impressed around the margins, vestiture short and uniform, eyes setose, last joint of maxillary palpi subtriangular, the outer edge broadly arcuate and a little longer than the apical edge, the latter straight, strongly oblique and twice as long as the inner side. Antennæ rather slender, nearly as in *Dasytes*. Epipleuræ slightly oblique, becoming inflexed and disappearing before the apex. Legs slender, tibiæ not spinulose and with terminal spurs; basal joint of tarsi not conspicuously hairy beneath, basal joint longer than the second; appendages of claws as long as the claws but separate from them apically for a variable distance.

D. impressicollis n. sp.

Elongate, subdepressed, a little wider posteriorly, piceous-brown, elytra usually a little paler, moderately shining; pubescence uniform, rather sparse, short and inclined. Antennæ but little longer than the head and prothorax (♀), a little more elongate (♂), scarcely thickened externally, clothed with short erect hairs in the ♀, and with longer

bristling hairs in the ♂, piceous, joints 2–4 pale; basal joint moderately thick, suboval, second joint similar but smaller, third elongate triangular, fourth subtriangular, about as wide as long, 5–10 oval, not much longer than wide, sixth and eighth a trifle smaller; eleventh ovate pointed, about three-fourths longer than the tenth. Head three-fourths as wide as the prothorax in the ♀, as wide as the prothorax in the ♂, closely rather coarsely punctate; front bi-impressed. Eyes moderate (♀), separated by about twice their vertical length; in the ♂ much larger, separated by their own length. Prothorax small, one-half wider than long (♀), widest before the middle, sides rather strongly rounded, margin finely serrulate, disk deeply and broadly transversely impressed along the apical and basal margins, the impressions coalescent laterally, leaving a transverse discal tumidity, whose summit is a little antemedian in position; moderately strongly but not densely punctate throughout, the summit of the tumidity somewhat smoother. Elytra very slightly wider at base than the prothorax, and about five times as long, gradually wider behind, their greatest width slightly more than half greater than that of the prothorax (♀), about twice that of the prothorax in the ♂; closely punctate throughout. Beneath a little more finely punctate, pubescence more recumbent. Legs brownish testaceous, thighs dusky. Length, 2.9–3.3 mm.; width, 1.2–1.6 mm.

California. Bartlett Springs (Fenyes), type; Big Trees, Calaveras County (Blaisdell); Tenino, Wash. (Schwarz and Barber).

In the male the fifth ventral is truncate and with a shallow rounded emargination at middle; the sixth smaller and similarly truncato-emarginate. In the female the fifth ventral is truncate, the sixth segment is apparenty normally exposed in both sexes.

D. longior n. sp.

Very similar to the preceding, but a little more elongate, the prothorax smaller, very little wider than the head in the ♀, and scarcely more than half as wide as the elytra in the same sex. In the ♂ the elytra are more than six times as long as the prothorax. Length, 3–3.4 mm.; width, 1.25–1.35 mm.

Fieldbrook, California (Schwarz and Barber).

The form of the fifth and sixth ventrals of the ♂ is the same as in *impressicollis;* in the ♀, however, the fifth ventral is less truncate than in the corresponding sex of *impressicollis*.

CHRYSOMELIDÆ.

SYNETOCEPHALUS new genus.

Elongate, parallel, glabrous above, sparsely pubescent beneath. Head large, a little wider than the prothorax, eyes broadly oval, moderately prominent, front not carinate between the antennæ. Antennæ long, filiform, fully three-fourths the length of the body, joints 2 and 3 equal and together scarcely as long as 4. Labrum transverse, truncate; last joint of maxillary palpi conical, acute, about twice as long as wide, shorter than the preceding joint, which is distinctly elongate. Prothorax transverse, narrowed behind, very narrowly margined at sides. Elytra elongate oblong, epipleuræ oblique, extending nearly to the apex. Anterior coxal cavities open behind, coxæ separated by a very thin lamina; middle coxæ more evidently separated. Legs slender, tibiæ straight, all armed at tip with a slender spur; basal joint of hind tarsus a little longer than the next two united, claws with a strong basal tooth.

The above characters are in the main those of *Luperodes*, near which the genus must take its place. The peculiar species upon which it is based does not, however, at all resemble *Luperodes*. The head somewhat strikingly suggests that of a *Syneta*, but it is relatively larger, with larger eyes. The non-carinate front, more slender antennæ, and the coarser and denser sculpture are notable divergencies from *Luperodes*, and taken with the cephalic peculiarity are sufficient for generic isolation.

S. autumnalis n. sp.

Elongate, parallel, testaceous, occiput, basal margin of elytra, epipleura and episterna suffused with reddish, tip of last antennal joint blackish; upper surface densely rather coarsely subrugosely punctate. Head large, front feebly convex and nearly smooth between the antennæ; frontal tubercles flat, limited behind by impressed lines, vertex and occiput densely punctate. Antennæ very slender, first joint as long as the next two, second and third subequal, together not quite as long as the fourth, fourth to eleventh subequal, nearly linear, each about five times as long as wide. Prothorax not quite as wide as the head, one-half wider than long, widest at apical third, or two-fifths, base broadly arcuate, scarcely as wide as apex, the latter squarely

truncate, all the angles minutely prominent. Elytra parallel, one-third wider than, and more than three times as long as the prothorax, and nearly twice as long as wide. Beneath shining, sparsely pubescent, obsoletely sparsely punctulate. Length, 4–4.3 mm.; width, 1.6–1.9 mm.

Sierra Madre Mountains near Pasadena, California—September.

I am indebted to Dr. Fenyes for my representatives of this most interesting species, which seems to be truly an autumnal one.

The above description applies to the male, the only female at hand differing in having the head not wider than the prothorax, and in entirely lacking the reddish tint present on certain parts of the body in the male. In the latter sex the last ventral is rather broadly deeply impressed in apical half, the impression narrowing in front, and the basal joint of the front and middle tarsi is parallel sided instead of narrowed basally as in the female. These basal joints though obviously feebly dilated are still very slender, being about four times as long as wide.

OPHRÆA Jacoby.

This genus has been established by Jacoby for a small number of Mexican species, which while structurally nearly identical with *Galerucella* differ by their shorter antennæ and nearly impubescent and finely rugose elytra. Some are posteriorly dilated, others not. *Rugosa* Jac., to which the species described below seems closely allied, is put in the group with dilated elytra, but the description says nearly parallel, and the plate indicates this.

O. arizonica n. sp.

Oblong oval, black, prothorax rufous with median elongate black spot; surface dull, the elytra with sparse exceedingly short and scarcely visible pubescence; punctuation of upper surface very dense, the punctures in actual contact or very nearly so throughout, coarser on the prothorax and basal parts of the elytra, becoming gradually finer apically. Antennæ less than half the length of the body, third and fourth joints equal. Prothorax fully twice as wide as long, widest behind the middle, sides arcuately convergent in front, the anterior angles minutely prominent, suddenly sinuate behind the point of greatest width, becom-

ing parallel for a short distance at base; hind angles rectangular, base obliquely sinuate each side, disk rather deeply tri-impressed Elytra nearly six times as long and one-half wider than the prothorax, one-half longer than wide, surface somewhat uneven, a vague sublateral sulcus, bounded externally by an obtuse rounded ridge extending from the humerous nearly to apex. Beneath dull, finely sparsely punctate and feebly wrinkled, last ventral with an obscure pale spot occupying a feeble depression on each side. Length, 8 mm.; width, 4⅓ mm.

Santa Rita Mountains, Arizona. A single specimen sent me by Prof. Snow.

Near *rugosa* Jac., but the latter has the prothorax immaculate and obsoletely depressed at sides and middle, and the fourth antennal joint one-half longer than the third.

NEOBROTICA Jac.

N. pluristicta n. sp.

Elongate ovate, wider behind, pale yellow, elytra each with two longitudinal series of three rounded small black spots, one subsutural the other lateral, with a smaller spot just outside the posterior subsutural one. Antennæ in great part and all the tibiæ and tarsi blackish, the front tibiæ pale internally. Antennæ about half the length of the body, third joint a little longer than the fourth, the base and two or three apical joints paler. Head sparsely punctate. Prothorax transversely subquadrate, sides parallel and feebly sinuate in basal half, broadly rounded and convergent in front, the side margin narrowed and deflexed anteriorly, basal margin oblique each side, the hind angles obtuse, surface impunctate and with a transverse bisinuate or biarcuate impression terminating outwardly in a fovea. Elytra twice as wide as the prothorax, widest at apical third, feebly shining, each with about twenty rather strongly and closely punctured striæ, the intervals very narrow, the alternate ones a little more prominent except at sides and apex, where the striæ show some tendency to become confused; sutural angle produced. Body beneath sparsely punctured and pubescent, moderately shining. Basal joint of hind tarsus evidently but not greatly longer than the next two. Length, 5.3–6.7 mm.; width, 2.6–3.1 mm.

Baboquivaria Mountains, Southern Arizona (Snow).

The elytral spots form three transverse series, a subbasal one with the outer spot on the umbone, the next just behind the middle, and the posterior one at the apical two-fifths, the outer spot being farther back than the inner one.

This is the first true *Neobrotica* to be recorded from within

our faunal limits, the *dorsata* of Say so referred by Dury having been properly removed and made the type of a new genus by Mr. Schaeffer. The species of *Neobrotica* are numerous in Mexico, and are very similar in general appearance to *Diabrotica*, differing by their appendiculate claws and usually strongly transversely impressed prothorax. *Pluristicta* appears to be most nearly related to *semicostata* Jac. by its elytral sculpture, but the latter is unspotted; the very brief description of Jacoby does not, however, permit a proper comparison.

LUPERODES Mots.

L. marginalis.

Pale yellow, head a little darker, lateral reflexed margin of prothorax and the sutural and lateral margin of elytra narrowly piceous, the sutural shade more or less evidently diffusedly dilated before the middle; three or four basal joints of antennæ pale, the following joints piceous except at base; body beneath piceous; legs entirely pale. Upper surface strongly shining, the head finely alutaceous and duller; punctuation moderately distinct and fairly close. Length 3 mm.

Alpine, Texas (Wickham).

With the exception of coloration, this species agrees very closely with *varicornis*, having as in that species joints 2–3 of the antennæ subequal and together not longer than the fourth, and the basal joint of the hind tarsi very evidently longer than the entire remainder; the sexual characters are also as in *varicornis*. In one example, which is evidently immature, the elytra lack the dark margin, and the body beneath is entirely pale; the narrow fuscous edge of the prothorax is, however, evident. According to the description of both LeConte and Horn *varicornis* is always entirely yellow, or at least of uniform shade above.

L. atricornis n. sp.

Oblong, moderately elongate, head brown, prothorax entirely yellow, antennæ, legs and metasternum black, abdomen paler. Upper surface polished throughout, the head with a few fine punctures posteriorly, prothorax scarcely visibly punctulate, elytra finely rather closely punctate. Antennæ fully two-thirds as long as the body, second joint a trifle longer than the third, the two together as long as the fourth. Front broadly convex, not at all carinate between the

antennæ. Prothorax nearly one-half wider than long, widest at middle, sides arcuate, minutely sinuate at the hind angles. Elytra parallel, barely two-fifths wider than the prothorax, three and one-third times as long and about two-thirds wider than the prothorax. Basal joint of hind tarsus very little longer than the next two. Length, 4.4 mm.; width, 2.25 mm.

Described from a single specimen taken by the late Prof. Snow in the Santa Rita Mountains, Arizona (8000 feet).

The type is a male having the last ventral truncate at middle and with two very short longitudinal incisions delimiting a sub-rectangular median lobe, which is moderately deeply impressed, the impression extending forward to the middle of the segment. By Horn's table this species will fall near *atriceps*, which, according to description, has the head black, the upper surface subopaque and more distinctly punctate, and the basal joint of hind tarsus much longer.

L. curvatus n. sp.

Oblong oval, pale yellow above, head brownish, antennæ entirely pale, body beneath brownish or piceous, legs pale, the femora more br less brown. Upper surface highly polished and subimpunctate throughout, the punctures very fine, sparse and feebly impressed. Joints 2–3 of antennæ subequal, together fully as long as the fourth. Front obtusely convex between the antennæ, impressed above the flattened tubercles. Prothorax rather large, moderately transverse, sides rounded and a little narrowed behind. Elytra one-third wider than the prothorax and a little more than two-fifths longer than wide. Basal joint of hind tarsus not longer than the two following. Length, 3 mm.; width, 1.7 mm.

Bishop, California. A single pair collected and kindly given me by Dr. Fenyes.

In the male the tibiæ are all curved at base, the basal joint of the front and middle tarsi is slightly dilated and the last ventral has an impressed median lobe, formed nearly as in the preceding species. In the female the tibiæ are straight, the basal joint of the four anterior tarsi more slender basally, and the last ventral is of the usual form for this sex. The color, relatively broad prothorax, nearly impunctate upper surface and curved male tibiæ easily distinguish this species from any other known to me.

L. crassicornis n. sp.

Oblong ovate, flavotestaceous, prothorax a little darker, head rufotestaceous to piceous, antennæ and legs pale, the femora darker. Antennæ not much longer than half the body, stout, joints 2–3 subequal, together fully as long as joint 4. In the male joint 3 is triangular and fully as wide as long, 4–10 triangular or subtriangular, 4 about one-half longer than wide. In the female the antennæ are less stout, joint 3 more oval and evidently longer than wide, the outer joints subtriangular and rather less than twice as long as wide. Upper surface throughout polished and very finely remotely punctulate. Tibiæ straight in both sexes. Basal joint of hind tarsus barely as long as the next two. Length, 3 mm.; width, 1.5 mm.

Mojave, California. June 1st. One ♂, three ♀s, taken by Dr. Fenyes.

The last ventral of the ♂ is broadly triangularly impressed for the greater part of its length, truncate at middle posteriorly, with a minute incision on each side; the basal joint of front and middle tarsi not appreciably dilated. *Crassicornis* closely mimics *curvatus*, especially the females, which but for the distinctly stouter and shorter antennæ of the former would be practically indistinguishable. In *curvatus* the antennæ are two-thirds as long as the body, the outer joints slender and fully three times as long as wide. The males are more readily separable, the prothorax being less broad in *crassicornis*, and the antennæ and tibiæ very different.

L. intermixtus n. sp.

Moderately elongate, black, elytra deep blue or blue-black, shining, femora piceous, tibiæ and tarsi testaceous, the four posterior tibiæ becoming gradually dusky apically. Antennæ rather slender and longer than half the body, piceous, three or four basal joints pale, joints 2–3 subequal, together not or scarcely longer than 4, the latter more than three times as long as wide and not longer than 5. Head rather small, eyes not prominent. Prothorax one-half wider than long, widest at middle, sides parallel and broadly arcuate, scarcely sinuate posteriorly, hind angles obtuse and not prominent, punctuation sparse and minute. Elytra three-fifths wider than the prothorax, two-thirds longer than wide, slightly oval, rather coarsely and closely punctate with intermixed much finer punctures, surface polished and without trace of reticulation. Basal joint of hind tarsus nearly as long as the three following. Length, 3.9–4.3 mm.; width, 1.9–2 mm.

Beulah, New Mexico (Cockerell), two females; Santa Rita Mountains, Arizona (Snow), one female.

By Horn's table this species must be associated with *morrisoni* and *varipes*, from both of which it differs by the less strongly oblong form, more transverse prothorax, non-reticulate elytra with distant intermixed punctuation, and the longer basal joint of the hind tarsus. In *morrisoni* the antennæ are much thicker, the fourth joint less than three times as long as wide, and distinctly longer than the fifth; the basal joint of the hind tarsus only as long as the next two.

L. nigrovirescens n. sp.

Form narrowly oblong, black, elytra with more or less evident dark greenish lustre; legs piceous, the front knees, tibiæ and tarsi pale, the middle knees usually more or less so. Antennæ piceous, the basal four joints pale, moderately slender, joints 2–3 subequal, together longer than the fourth, the latter three times as long as wide and scarcely longer than the fifth. Head subimpunctate, eyes moderately prominent. Prothorax one-fourth wider than long, widest in front of the middle, sides rather strongly arcuate anteriorly, sinuate posteriorly, front angles thickened, hind angles obtuse but sharply defined and slightly prominent, punctuation very sparse and minute, scarcely perceptible toward the middle of the disk. Elytra parallel, nearly twice as long as wide, three-fifths wider than the prothorax, very finely reticulate, finely rather sparsely punctate. Hind tibiæ straight; basal joint of hind tarsus as long as the next two. Last ventral of male broadly truncate behind, of female, oval. Length, 3.4–3.8 mm.; width, 1.5–1.6 mm.

Florissant, Colo. (Cockerell); eight examples, on flowers of *Juncus*.

This species is also allied to *morrisoni* and *varipes*. As compared with the former it is smaller, much less brilliant in color, with rather more slender antennæ, the fourth joint not longer than the fifth, the punctuation finer throughout. It differs from *varipes* also in its smaller size, duller color, and in having the prothorax more transverse and the hind tibiæ straight in both sexes.

HALTICA Geoff.

The species of this genus constitute a difficult study, and in making known some of the nondescript material which has accumulated in my cabinet, it has been hard to decide where to stop. We know as yet far too little of the extent

of variation within specific limits to enable us to speak with much assurance. In the case of *ignita* this variation is assumed to be very great, but I think it probable that this complex will ultimately be broken up. The opening wedge is here inserted by giving names to three forms from California and Florida, which by the latest paper on the genus would pass as *ignita*. Some further investigation of this and other species of *Haltica* is contemplated, but cannot be prosecuted at this time.

H. probata n. sp.

Green bronze, entire upper surface polished and strongly shining, sculpture throughout nearly as in *ignita*. Antennæ piceous, slightly more than half the length of the body; joints 2–3–4 gradually increasing in length, the fourth very nearly three times as long as wide, the tenth about two and one-half times as long as wide. Eyes rather small and not very prominent, their width as seen from the front distinctly less than half the interocular distance. Prothorax two-thirds wider than long, sides parallel in basal half, convergent anteriorly. Elytra fully two-thirds as wide as long, and nearly three-fourths wider than the prothorax. Body beneath piceous; abdomen alutaceous, rather coarsely punctate and transversely rugulose. Length 3.7–4 mm.

California (Belmont and Santa Rosa).

This species is closely allied to *ignita*, and if this latter be really as variable as the material referred to it in collections would indicate, then the present form is no more than a variety of this protean species. It is far more likely however—as indicated above—that more critical study and a better acquaintance with life habits, will resolve this heterogeneous mass into a number of sufficiently well defined species. *Probata* is at the upper limit in size of *ignita*, the color invariable so far as seen, the antennæ more slender than in *ignita*, the prothorax a little more narrowed in front, and the abdominal sculpture coarser; comparison being made with the brilliant coppery golden form of the Middle Atlantic States, which I assume to be typical *ignita*. The punctuation of the elytra is to some extent dual, consisting of larger and smaller punctures intermixed (the latter quite minute) as is the case in the true *ignita*. Dr. Horn speaks of the

intermixed character of the punctuation in his remarks under *ignita*, but a little farther on under *obolina* he inconsistently says—"this species resembles the more brilliant forms of *ignita*, and the elytral punctuation is similar, except that in *ignita* the intermediate finer punctures have not been observed." As a matter of fact this intermixed punctuation is quite obvious in many other species besides the two here mentioned.

H. litigata n. sp.

Elongate oval, moderately convex, green ; head and prothorax finely but distinctly alutaceous, elytra still more finely so and more shining. Antennæ piceous, basal joints brownish, moderately stout, nearly as in *ignita*, the fourth joint about two and one-half times as long as wide, the tenth barely twice as long as wide. Eyes a little larger and distinctly more prominent than in *ignita*, the width of the head across the eyes fully four-fifths that of the prothorax at its widest point (in *ignita* about two-thirds that of the prothorax); frontal tubercles small, flat, well separated, the contiguous surface of the vertex not at all rugulose or punctate ; frontal carina rather obtuse. Prothorax slightly less than two-fifths wider than long, sides evidently narrowed in front, margin moderately wide, ante-basal groove well defined and entire ; punctuation very sparse and minute, a few larger punctures at the sides anteriorly. Elytra three-fourths wider than the prothorax, punctuation nearly as in *ignita*, the intermixed finer punctures less obvious. Beneath piceous, finely punctate and alutaceous. Femora piceous, slightly bronzed, tibiæ and tarsi brownish-testaceous. Length 3.4–3.6 mm.

Florida. One example from Enterprise (Griffith), others without definite locality.

This is one of the forms that by Horn's table would fall with *ignita*. It seems clearly enough distinct by its more alutaceous sculpture, more prominent eyes, slightly more trapezoidal prothorax, with rather less deep ante-basal groove, and the pale tibiæ and tarsi. The last ventral of the male is the same as in *ignita*.

H. suspecta n. sp.

Dark green bronze, shining, the upper surface obsoletely alutaceous. Eyes unusually large, their width as seen from the front equal to one-half their distance apart. Very close to the preceding species (*litigata*), with which it agrees except as follows : Vertex a little less smooth, eyes even slightly larger, prothorax less suddenly narrowed

in front, the sides very broadly nearly evenly arcuate, punctuation more evident, though very fine. Length 3–3.5 mm.

California (San Diego, type; Pasadena).

Numerous specimens. A single specimen taken by the writer in the San Bernardino Mountains is still smaller but apparently identical. One example from Alameda County is included provisionally; the prothoracic groove is a little less developed, but I think this is only an individual variation.

H. nitidiventris n. sp.

Oval, convex, deep blue, polished and strongly shining both above and beneath. Antennæ rather slender, longer than half the body, piceous, basal joints paler, the third and fourth equal in length. Eyes small, not prominent, their width as seen from the front but little more than one-fourth the interocular width; frontal tubercles flat, vertex smooth, frontal carina moderate, acute. Prothorax about one-fourth wider than long, sides evenly arcuate, base but slightly wider than the apex, basal margin evenly arcuate from side to side, hind angles minutely dentiform and prominent, front angles thickened and obliquely truncate, basal groove very deep and entire, surface very sparsely, barely visibly punctulate, a few coarse punctures in the antero-lateral region. Elytra one-third longer than wide, fully three-fourths wider than the prothorax, and a little less than three times as long; disk broadly not strongly impressed behind the humeral umbone, punctuation fine, sparse, becoming obsolete apically. Body beneath shining and very sparsely and finely punctate. Length $2\frac{3}{4}$ mm.

El Taste, Lower California. One example, collected by Mr. Beyer.

By the deep entire prothoracic groove this species will be associated with *ignita* and allies. It may at once be separated by its small size, small eyes, which are but little more prominent than the postocular parts, and the shining ventral surface. This is possibly the insect recorded by Horn as *ignita* in the Lower California List.

H. convicta n. sp.

Elongate oval, twice as long as wide, cupreous, moderately shining, head distinctly, prothorax and elytra obscurely alutaceous. Antennæ stout, two-thirds as long as the body, testaceous, apices of the outer joints more or less dusky; joints 2–3–4 gradually longer, fourth but little more than twice as long as wide. Eyes moderate, their width as seen from the front less than half the interocular width; frontal tubercles flat, but evidently elevated above the contiguous portion of the

vertex, which is more or less rugulose. Prothorax moderately transverse, a little narrowed anteriorly, sides arcuate, ante-basal groove broad and shallow on the disk with impressed line at bottom, terminating in a fovea at each extremity; surface finely not closely punctate. Elytra punctate as in *ignita*. Beneath dark cupreous, alutaceous, moderately punctate. Length 3 mm.

California; Redondo (type) and Pomona.

The last ventral of the male is sinuate each side, the lobe rounded, broadly impressed and more shining. *Convicta* is closely allied to *evicta*, but the latter is much larger with a polished head, dark antennæ, more alutaceous thorax, and with a better marked fovea at the end of the transverse groove. The frontal tubercles in *evicta* are scarcely at all elevated above the plane of the contiguous vertex.

H. ovulata n. sp.

Elongate oval, blue, shining, upper surface finely alutaceous and sparsely finely punctate, the elytral punctures scarcely coarser than those of the prothorax. Antennæ piceous, longer than half the body, evidently thickened apically, joints 2–3–4 gradually longer, the fourth three times as long as wide. Eyes not prominent, their width as seen from the front about one-third the interocular width; frontal tubercles rather broad, frontal carina obtuse, vertex smooth. Prothorax unusually elongate, but slightly more than one-fourth wider than long, very little narrowed in front, sides very feebly arcuate, narrowly margined, basal margin bisinuate each side, basal groove faint. Elytra oval, humeri not prominent, no post-humeral impression. Body beneath dark blue, alutaceous, more coarsely punctate than above. Length, 4.3 mm.; width, 1.8 mm.

Cañon City, Colorado.

The unique type is a ♂ having the lobe of the last ventral segment flattened and shining, a little impressed at tip and with a shallow impressed line extending the entire length of the segment.

By Horn's table this species would fall with *tombacina* and *marevagans* because of the apically thickened antennæ, and the fourth antennal joint longer than the third. Its more oval form, however, allies it to *californica* and *obliterata*. It is much more finely alutaceous and more shining than the latter, and the prothorax is more elongate and the general form narrower than in either; the prothorax is also much more finely margined than in *tombacina*, *marevagans* or *obsoleta*, being about the same as in *californica*.

H. ludoviciana n. sp.

Oblong ovate, a little wider behind, dark steel blue, moderately shining; antennæ and legs entirely rufotestaceous. Antennæ but little more than half the length of the body, third joint nearly as long as the fourth, second much shorter. Prothorax scarcely one-third wider than long, base but little wider than the apex, sides subparallel and feebly sinuate in basal three-fifths, thence broadly rounded and a little convergent, side margins moderate, surface shining and sparsely punctate, ante-basal impression almost obliterated except its extremities. Elytra much wider at base than the prothorax, humeral umbone rather prominent, disk broadly tumid on each side of the suture near the base, surface minutely subobsoletely alutaceous, rather sparsely punctate, more coarsely at base, very finely at apex, the punctures showing a tendency toward a serial arrangement, especially toward the base. Body beneath black, very finely punctulate, dull, pubescent. Length, 4.3 mm.; width, 2.2 mm.

Morgan City, Louisiana (Wickham).

By its pale legs and antennæ, and nearly obsolete basal impression of the prothorax this species will stand near *opulenta*, which differs in color, and in having the prothorax much wider basally, the elytra not wider at base than the base of the prothorax, and with broadly rounded humeri. The form in *ludoviciana* is rather strikingly suggestive of certain *Luperodes*, e. g., *meraca* and *lecontei*, except in being a little more widened posteriorly.

H. testacea n. sp.

Elongate oval, convex, entirely testaceous, head and prothorax strongly shining, elytra minutely alutaceous, moderately shining. Antennæ half the length of the body, joints 3 and 4 equal, the third perhaps a trifle longer than the fourth, each barely twice as long as wide. Eyes moderate, their width as seen from the front about one-third their distance apart; frontal tubercles small, well separated; frontal carina moderate, vertex smooth. Prothorax moderately transverse, distinctly narrowed in front, side margin very fine, ante-basal groove feeble, punctuation fine, rather sparse. Elytra oval, not appreciably wider at base than the base of the thorax, umbone not prominent, punctuation a little coarser and closer than on the thorax, not much finer apically. Beneath moderately punctate, alutaceous. Length, 3.8 mm.; width, 1.9 mm.

Big Springs, Texas (Wickham). A single example.

The entirely pale color, which does not appear to be due at all to immaturity, will separate this from any other species

of our fauna. *Rufa* is much broader and less convex, and has black legs and antennæ. The punctuation, especially of the elytra, is distinctly dual in size.

H. foliacea Lec., and **H. punctipennis** Lec.

A comparison of the types of these two species shows them to be practically identical, the structure of the last ventral in the males being virtually the same notwithstanding Horn's statement of difference. The name *punctipennis* was first given by LeConte in MSS., and reference is made to it in the description of *foliacea ;* the latter, however, was published first and must prevail.

HEMIGLYPTUS Horn.

This genus is here mentioned in order to call attention to a somewhat serious error in Horn's Monograph of the Halticini. The genus was erected for the *Crepidodera basalis* of Crotch because of the presence of a terminal spur on all the tibiæ, and it is said by Horn to differ in this respect not only from the other species of *Crepidodera*, but from all other genera of the Halticini. In another place he says that all the tibiæ are thus armed in *Blepharida* and *Hemiglyptus* only. A careful examination shows that the terminal spur is present on all the tibiæ of all species of *Crepidodera* in my collection, and furthermore, not only *Blepharida*, but several other genera are similarly equipped. The spurs of the front and middle tibiæ are it is true very small and difficult to detect in so small an insect as a *Crepidodera*, but they may be seen at a glance in the larger species of *Haltica* and *Systena*. Although the genus *Hemiglyptus* cannot stand on any peculiarity of tibial armature, it may properly be retained because of a number of divergencies from typical *Crepidodera*. notably the confused elytral punctuation.

CREPIDODERA Chev.

C. pallida n. sp.

Elongate oval, entirely testaceous, shining. Antennæ half as long as the body, rather slender, joints 3–4 subequal, outer joints very gradually slightly longer, the tenth more than twice as long as wide. Frontal tubercles and carina moderate. Prothorax one-fourth wider

than long, not narrowed in front, sides broadly evenly arcuate, a little sinuate at base and behind the front angles, which are obliquely truncate; ante-basal impression deep, limited each side by a short longitudinal one; disk sparsely finely punctate at middle, broadly smooth laterally, basal impression more strongly punctate at bottom. Elytra oval, three-sevenths longer than wide, nearly one-half wider than the prothorax, striæ not impressed, consisting of elongate punctures, becoming obsolete apically except near the suture; intervals flat, impunctate, the marginal one wider. Prosternum coarsely densely punctate at middle, the propleuræ smooth; metasternum and abdomen finely transversely wrinkled and finely punctate, finely pubescent. Length, 3.6 mm.; width, 1.7 mm.

Castle Crag, Northern California. Two examples collected by Dr. Fenyes.

This fine species is larger than any previously described from our fauna, and differs from all others in the uniform pale reddish testaceous color. It is most nearly allied to *robusta*, but is more elongate, with more slender antennæ, smoother prothorax and less coarse elytral strial punctures. The striæ are inclined to be a little irregular or confused in *pallida;* the ninth stria is more distant from the margin than from the eighth, in which respect it agrees with *robusta* only.

SYSTENA Chev.

S. sexnotata n. sp.

Subdepressed, broader behind, pale yellow, strongly shining, elytra each with a subsutural spot near the base and two others in a transverse line at the middle, black. Antennæ slender, a little longer than half the body, outer joints infuscate, third joint not quite as long as the fourth. Head smooth at middle, minutely punctate toward the eyes, prothorax scarcely visibly punctulate; elytra finely, lightly, not densely punctate. Body beneath less shining, sparsely punctulate and sparsely pubescent. Length, 4.8–5.5 mm.; width, 2.5–2.7 mm.

Alpine, Texas (Wickham).

Very distinct from any of our previously discribed species by its large size, color, and posteriorly widened subdepressed form. It seems closer to the Mexican *variabilis* than anything else, but this last is said to have the third and fourth antennal joints equal, and the elytra very closely punctate. In some specimens of *sexnotata* the outer edge of the front and middle tibiæ, and the apex of the hind femora are infuscate, but no other variation is observable in the five specimens at hand.

BRUCHIDÆ.

BRUCHUS Linn.

Within the last few years no less than twenty species have been added to our fauna in this genus. Among these are a few previously known Mexican species which have turned up on our side of the border, but the greater number have been recently described by Mr. Schaeffer from collections made at Brownsville, Texas, and in Southern Arizona. That our resources are not yet exhausted is evident from the fact that after carefully checking off the recently added forms, there still remain in my collection some seventeen undescribed species, the most of which will be made known in the following pages. Many of Mr. Schaeffer's species are fine strongly characterized forms which may be easily identified from the descriptions; on the other hand the greater number here described are relatively small and obscure, which taken together with the fact that nearly forty species have now been added since our latest synopsis, has prompted me to prepare new tables and add some notes and corrections.

In this brief survey I have followed the Horn system of division into groups while recognizing the fact that this in some cases does violence to a natural arrangement of the species.

Group VI, which was based on depauperate individuals of Group VII, I have combined with the latter, and I have interpolated VIIIa to contain a few species having four denticles in addition to the longer femoral tooth. In a more scientific division of the species it is probable that all of Horn's groups after the fifth should be united, the number of denticles serving merely as a clue to identification within the group.

To facilitate the use of the following tables I give below, with the slight modification above mentioned, Horn's system of grouping.

Thorax with tooth at middle of side.
  Hind femur with tooth on outer side only.....Group I.
Thorax not toothed at sides.
  Disc of thorax elevated with median groove.....Group II.
  Disc of thorax simply convex.

Hind femur with a tooth on both inner and outer margins. Group III.
Hind femur mutic; anteunæ pectinate or flabellate in the ♂. Group IV.
Hind femur with one tooth only, on inner margin .....Group V.
Hind femur with one tooth, and one or more commonly two denticles .....Groups VI–VII.
Hind femur with one tooth and three denticles.....Group VIII.
Hind femur with one tooth and four denticles.....Group VIIIa
Hind femur with a few small denticles only.....Group IX.

Group I.

This Group includes only two species *pisorum* and *rufimanus*, the former the well-known cosmopolitan pea weevil, the latter first recorded by Horn as having been reared from pea pods imported from Switzerland. I have seen no native specimens of *rufimanus*, and do not know whether the species has become established with us. The two species are closely allied and are briefly separated by Horn thus:

Thorax behind lateral tooth sinuate .....**rufimanus** Sch.
Thorax behind lateral tooth not sinuate.....**pisorum** Linn.

Only a single Italian specimen of *rufimanus* is before me, but judging from this the above distinction is not very marked, and I would suggest the following:

Tooth of hind femur ill-developed, femora (except at base) and tibiæ of the anterior legs rufous.....**rufimanus.**
Tooth of hind femur long and acute, front tibiæ and apical portion of middle tibiæ rufous.....**pisorum.**

Horn says that the middle tibiæ of the male are more or less arcuate and with a small acute tooth on the inner margin near the tip. I find in males of *pisorum* that the middle tibiæ are distinctly sinuate internally, the external margin only slightly arcuate, and the inner apical angle with a moderately long spur. I do not detect any tooth on the inner margin near the tip, and unless Horn's statement applies to *rufimanus* alone, it is seriously lacking in precision.

Group II.

The following species agree in having the disk of the prothorax uneven, though very variably so. *Mimus* differs

rather markedly in type from the other three by its more depressed form, more widely separated eyes, stouter more numerously dentate thighs, somewhat uneven elytral disk and broader scutellum:

Disk of prothorax with both median and dorso-lateral prominences; prevailing color brown; thighs very stout, armed with four acute teeth, decreasing in length posteriorly. (Middle States to Kansas and Texas.).....**mimus** Say.

Disk of prothorax without sublateral tuberculations; hind thighs unidentate; prevailing colors black and white.

Eyes emarginate to middle, antennæ less slender, outer joints subquadrate or distinctly transverse.

Disk of prothorax more strongly tuberculate posteriorly than anteriorly, legs bicolored, elytra tessellate. (Phœnix and Pinal Mountains, Arizona.).....**arizonensis** Schf.

Disk of prothorax strongly gibbous in front, feebly tuberculate posteriorly; legs pale rufous, the tarsi dark; elytra with large median and apical black spots. (Arizona, Utah, California.).....**gibbithorax** Sch.

Eyes very deeply emarginate; antennæ slender, all the joints longer than wide; prothoracic tuberosities subequal but feeble; legs black; elytra with a conspicuous lateral median black spot. Texas (Brownsville and San Diego)..**texanus** Schf.

B. mimus Say.

The large oval smooth space on the pygidium is characteristic of the female rather than the male, as stated by Horn.

Group III.

Three more or less dissimilar species, *chinensis*, *quadrimaculatus* and *sordidus*, have constituted this, the third Group in the Horn system, characterized by a single tooth on both the inner and outer margins of the hind femur. In *chinensis* (*scutellaris* Fab.) and *quadrimaculatus* the two teeth are of about equal length, the outer one, however, being distinctly stouter and more triangular. In *sordidus* the outer tooth is always much shorter than the inner and often ill-defined. I have, therefore, transferred it to Group V, with which it agrees well in general habitus, and to which specimens with undeveloped external tooth would naturally be referred. In *pruininus* of this group there is a more or less obvious angulation of the outer margin of the femur which may be

quite as distinct as in many specimens of *sordidus*, in fact the two species seem quite closely allied. *Chinensis*, by its short, thick, cuboidal form, pectinate male antennæ, vertical pygidium and short intermediate ventral segments is manifestly allied to the species of Group IV. The affinities of *quadrimaculatus* are probably more nearly with *chinensis* than any other of our species, but it differs notably in its longer more depressed form, more oblique pygidium and simple male antennæ.

Horn was probably correct in considering *biguttelus* Sch. a dark colored male of *chinensis*, *sinuatus* Sch. a form of *quadrimaculatus*, and *maculatus* Fab. identical with *quadrimaculatus;* these names, therefore, should be dropped from our list. *Ambiguus* Sch. is still unknown to us, and its position in this group, as Horn remarks, is not quite certain, though very probable because of the comparison with *quadrimaculatus*. Our species may be briefly characterized as follows :

Front carinate, prothoracic lobe with two short confluent spots of white pubescence, one on either side of the median groove, elytra varicolored, fourth and fifth elytral striæ shortest, femoral teeth subequal in length.

Form short and thick, antennæ of ♂ pectinate, pygidium perpendicular, white hairs of thoracic lobe with ivory lustre (Cosmopolitan species).....**chinensis** Linn.

Form more elongate and depressed, antennæ of ♂ not pectinate, pygidium more or less oblique at base, white hairs of thoracic lobe not distinctly eburneous. (Southern States).
quadrimaculatus Fab.

Similar to *quadrimaculatus*, but more than twice as large. (Louisiana.).....**ambiguus** Sch.

Group IV.

The species of this group are strongly characterized by their robust quadrate form, pectinate or flabellate male antennæ, very large eyes which are almost approximate in the male, narrowly separated in the female ; perpendicular pygidium, ventral segments 2–4 very short, together not or scarcely longer than the first segment behind the coxal plates ; fourth and fifth elytral striæ short, attaining about the apical

fourth; basal joint of hind tarsus very long. Only females of *crenatus* are known, but the male will probably prove to have the approximate eyes and pectinate antennæ of the group. Our species are not numerous, and may be separated as follows:

Hind femur not serrate beneath.

Elytra with rows of coarse, deep, perforate punctures; hind tibia bicarinate externally, the terminal spur long and stout. (Georgia, Texas).....**coryphæ** Oliv.

Elytral striæ normally punctate, hind tibiæ unicarinate externally, terminal spur short.

Elytra a little narrowed behind, black with a large red spot or vitta; pygidium densely white pubescent with black spots; size larger.

Maximum length of antennal rami (♂) nearly equal to the width of the prothorax, discal spots of pygidium rounded, separated; legs black. (New Jersey to Manitoba and Colorado). **discoideus** Say.

Maximum length of antennal rami (♂) not or but little more than half the thoracic width, discal spots of pygidium transverse and confluent; legs wholly or in part rufous (Lower California).....**leucosomus** Sharp.

Elytra parallel, reddish-brown, more or less maculate about the margins with black, pygidium without spots; size smaller. (Arizona, S. E. California.).....**impiger** Horn.

Hind femur serrate or crenate beneath on the inner margin.

Black, maculate with reddish-brown, pubescence variegated; size smaller (2–2½ mm.). (Southern Arizona). **serratifemur** Schf.

Black throughout, pubescence gray, size large (4 mm.). (Southern Arizona.).....**crenatus** Schf.

Group V.

Of the thirteen species tabulated below, three—*simulans*, *subæneus* and *pygidialis*—are unknown to me in nature. Judging from the descriptions the first of these is typical of the group, the second is perhaps fairly so, and the third, by its longer antennæ and perpendicular pygidium seems somewhat out of line. Of the remaining species *ulkei* is decidedly abberant, its affinities being with *amicus* and allies of the following group; while *pruininus* and *sordidus* are divergent in their less oblique pygidium, longer posterior tibial mucro, and notably in having the fifth and sixth elytral striæ shortest,

instead of the fourth and fifth as in all the typical species of the group. In this latter particular *ulkei* also agrees with *pruininus* and *sordidus* as might be expected from its affinities with Group VII, in which this is the prevailing style of striation.

Vertex with subtriangular, glabrous, impunctate area; prothorax and broad triangular sutural area very densely whitish pubescent, sides of elytra black, more broadly so posteriorly; size large (4–5 mm.); form more elongate. (Arizona.) **ulkei** Horn.

Vertex without glabrous impunctate area, pubescence never very dense; size smaller (2–3½ mm.); form broader.

Elytra black with rufous spots or spaces.

Rufous spot transverse, submedian, nearer the base than the apex, attaining the sides but not or scarcely the suture.

Hind legs black, antennæ black except at base, elytral spots less narrowly separated at the suture, size larger—about 3 mm. (New Jersey, Tennessee, Missouri, Kansas.) **bivulneratus** Horn.

Legs and antennæ rufous, elytral spots very narrowly separated at suture, size smaller—but little over 2 mm. (Southern Arizona.).....**auctus** n. sp.

Rufous spot variable but normally longitudinal and elongate.

Form more depressed, size small (2 mm.), antennæ and legs entirely red, rufous spot involving the whole elytron, except a narrow basal margin and the sutural edge; varies with the elytra black, having a very small diffuse median pale spot. (Southern California.).....**discopterus** n. sp.

Form stouter, size larger—about 3 mm.—antennæ black except at base.

Legs red except base of hind femora, elytra in great part rufous, the base, apex and suture, the latter more widely at base, black. (Texas, New Mexico, Arizona.) **discolor** Horn.

Four anterior legs rufous, hind legs black.

Rufous spot of elytra emarginate at sides, prothorax more densely punctate and dull, terminal spur of hind tibia equal in length to the thickness of the first tarsal joint. (Arizona, Lower California.).....**limbatus** Horn,

Rufous spot usually smaller, sometimes confined to the outer apical angle, not emarginate externally; prothorax less densely punctate, shining; spur of hind tibia short, about half as long as the thickness of the first tarsal joint. (New York to Dakota and Texas.).....**cruentatus** Horn.

Legs entirely black, rufous spot large, apical. (Southern Arizona.).....**simulans** Schf.

Elytra entirely black.

Elytral pubescence uniform in color and distribution, surface without trace of æneous lustre.

Pygidium unicolorous.

Eyes flatter than usual, spur of hind tibia short, about half as long as the width of the first tarsal joint, pubescence sparser, legs variable in color. (Middle States).....**nigrinus** Horn.

Eyes normally convex and prominent, spur of hind tibia a little longer than the width of the first tarsal joint, pubescence denser, four anterior legs pale rufous, hind legs black. (Arizona, Southern California.).....**pruininus** Horn.

Pygidium with two or three basal white spots. (Southern Arizona,).....**pygidialis** Schf.

Elytral pubescence variegated.

Surface without æneous lustre, eyes normally prominent, front not carinate. (Brownsville, Texas, to Lower California.) **sordidus** Horn.

Surface lustre æneous, eyes flatter, front carinate. (Texas.) **subæneus** Schf.

B. ulkei Horn.

This species of the same form as *amicus* of the following group, with which it agrees in the peculiar glabrous impunctate area of the vertex; the eyes, however, are normally convex. It looks much out of place in the present group, and is tabulated here merely because of the dentation of the hind thighs.

B. nigrinus Horn.

Except for the absence of the red elytral spot, this could not possibly be separated from *cruentatus*, and I believe it to be only an immaculate variety as already hinted by Mr. Schaeffer. The legs are quite variable in color, being either entirely black with the front and middle tibiæ rufescent, or with the four anterior legs pale and the hind femora and tibiæ bicolored.

B. auctus n. sp.

Very close to and perhaps only a variety or race of *bivulneratus*, from which it differs in the generally smaller size and bright rufo-testaceous legs and antennæ, the latter sometimes with the intermediate joints somewhat infuscate. The pubescence of the pronotum is distinctly bicolored, being ochreo-fuscous at the middle of the disk, changing to

cinereous laterally, more conspicuously so in an anterior and a posterior sublateral spot. In *bivulneratus* the pronotal pubescence is nearly uniform in color. Length, 2.2 mm.; width, 1.4 mm.

Santa Rita Mountains, Arizona. Taken by Prof. Snow and by Hubbard and Schwarz.

B. discopterus n. sp.

Moderately stout, black, elytra rufotestaceous with the sutural interspace and base narrowly black; antennæ and legs entirely pale rufotestaceous; pubescence rather sparse, uniformly ochreo-cinereous. Antennæ short, not passing the humeri, very strongly incrassate, fourth joint as wide as long, 5–10 transverse, the outer ones about twice as wide as long. Eyes moderate, separated by about their own width. Head finely closely punctate and dull, front not carinate. Prothorax a little wider than long, conical, sides feebly evenly arcuate, not appreciably sinuate behind, punctuation close and rather coarse, finer punctures not very evident. Scutellum short, apparently emarginate behind, clothed with denser pubescence. Elytra as wide as long or very nearly so, sides broadly arcuate, striæ fine, evidently punctate, intervals flat, finely rugoso-punctate. Pygidium thinly nearly evenly pubescent, rather coarsely and closely not very shallowly punctate. Hind thighs moderate, armed with a single small acute tooth near the apex; hind tibiæ feebly obtusely carinate externally, the inner apical mucro short, not apparently longer than the other marginal denticles. Length, 2 mm.; width, 1.2 mm.

Elsinore, Southern California (Prof. C. F. Baker).

With the type I place a second specimen from the same source and similarly labeled, which agrees so perfectly in most respects that I can scarcely doubt their identity. Both specimens appear to be males, but of this I am not certain. This second example is a little more robust and with slightly stouter hind thighs armed with a longer tooth; the color is black, the elytra with only a small diffuse median pale spot on each elytron, the pubescence ochreo-cinereous in a broad transverse fascia on the elytra, but anteriorly and apically it is dark and unconspicuous, resembling in this latter respect *bivulneratus*. As in *bivulneratus* the elytra seem to be a little impressed along the suture in this second specimen, but not appreciably so in the type.

The species is obviously related to *bivulneratus*, but is smaller, less stout, the prothorax less transverse, the antennæ and legs entirely pale, the median line of the prothorax not or scarcely impressed at base.

Group VII.

As already stated, Group VI of Horn will be included here. Of the three species referred to it, *desertorum* is only a small form of *prosopis*, and usually has the hind femora armed with two denticles, while *aureolus* and *pauperculus* may have either one or two denticles as was recognized by Horn, who tabulated them in both groups. The number and size of the femoral denticles is like all other characters subject to variation, which usually manifests itself as a reduction in size and occasionally a complete loss of a denticle in the smaller individuals. More rarely an extra denticle may appear, as I have observed in *musculus* and *obtectus*, where there are not infrequently three present, though the normal number is evidently two. *Exiguus* of the following group, though typically with three denticles, shows often only two, and thus would be referred to the present group, the tabular characters leading to *floridæ*, which indeed I am inclined to believe is really not distinct from *exiguus*.

The species of this group are about as numerous as in all the others together. The form is never very thick and cuboidal, and is usually distinctly more depressed and elongate than in the other groups. The antennæ are never flabellate or pectinate, rarely strongly serrate, and seldom reach as far as the middle of the elytra; they attain their greatest development in *pectoralis*, *bisignatus*, *macrophthalmus*, *distinguendus*, *subserripes* and *inquisitus*. The fifth and sixth elytral striæ are shortest in nearly all species, the only exceptions among the species known to me being *bisignatus*, *subserripes* and *alboscutellatus*, all of which are aberrant in the group in at least one other respect. In quite a number of species the first ventral segment of the male is sexually modified. In *perforatus* and *lobatus* the surface is concave at middle and produced apically in the form of a broadly rounded porrect or slightly deflexed lobe. In *aureolas*, *fraterculus*, *collusus*, *perplexus*, *pullus*, and presumably in *mixtus*, the central area, which may or may not be distinctly flattened or slightly concave, is margined at sides, and more especially at apex with longer hairs, and there is near the base a small more or less

distinct fovea, which is more densely sculptured and pubescent. In these species, while there is no projecting lobe, the posterior margin of the segment is usually arcuately prominent at middle, which peculiarity is generally visible in some degree also in the females. In *pulloides*, *biustulus* and *fumatus* the longer hairs are scarcely evident, but the fovea can usually be discerned.

The following table will serve fairly well for the identification of the species now known, but I have been unable to arrange them in a satisfactory linear series; indeed, I doubt if such an arrangement is possible:

1. Vertex with short, broadly transverse, subtriangular, glabrous, impunctate area; body elongate, pygidium strongly oblique, apical spur of hind tibia short; species of more than average size.
   Very elongate, depressed, last ventral concave, more strongly so in the ♂, and in both sexes nearly as long as the three preceding. (Texas to Lower California.) **protractus** Horn.
   Less elongate and more convex, last ventral not concave, about as long as the preceding in the ♂, longer but not exceeding the two preceding in the ♀.
      Black, prothorax and base of elytra sometimes rufous or rufescent, pubescence uniformly cinereous, eyes flattened and not more prominent posteriorly than the sides of the head. (Texas, Arizona.) ..... **amicus** Horn.
      Ferrugineous or brown, pubescence brown variegated with grayish lines and spots; eyes normally prominent. (Brownsville, Texas.) ..... **sallæi** Sharp.
2. Vertex without glabrous impunctate area.
   Body above wholly or in great part rufotestaceous to ferruginous ..... 3.
   Body above wholly or in great part black ..... 4.
3. Scutellum elongate oblong, nearly twice as long as wide, pygidium strongly oblique.
   Pygidium of ♀ with two longitudinal parallel, dark, glabrous impressions near the apex; fourth antennal joint of ♂ not or but slightly wider than the third. (Texas to Lower California.) ..... **uniformis, desertorum, prosopis** Lec.
   Pygidium of ♀ without impressions; antennæ more elongate, the fourth joint of the ♂ nearly twice as wide as the third. (Texas.) ..... **prosopoides** Schf.

Scutellum much less elongate, either subquadrate, rounded or transverse.

Eyes large, narrowly separated on the front, the latter carinate between them; antennæ—especially of the ♂—long and rather strongly serrate.

Prothorax, under surface, base of hind thighs and joints 5–10 of antennæ, black; elytra rufous with lateral black spot. (Kansas, New Mexico.).....**bisignatus** Horn.

Entirely ferruginous, either uniformly clothed with pale pubescence, or with some darker spots on some of the elytral intervals. (Brownsville, Texas.)
macrophthalmus Schf.

Eyes smaller and more distant, separated as a rule by about their own width.

Pubescence more or less variegated.

Elytra conspicuously tessellate with elongate spots of black, white, and luteous pubescence. (Southern Arizona.)
speciosus Schf.

Elytra much less conspicuously variegated with luteous or cinereous and darker ochreous or brownish pubescence.

Scutellum small, rounded; apical spur of hind tibia short, about one-sixth the length of the first tarsal joint. (Texas.) .....**pectoralis** Horn.

Scutellum oblong, subquadrate or slightly elongate, emarginate at apex; apical spur of hind tibia moderately long, about one-fourth the length of the first tarsal joint.

Denticles of hind thighs closely approximate to the long tooth, the anterior one connate or subconnate at base with the latter. (Texas.) .....**ochraceus** Schf.

Denticles of hind thighs smaller and distinctly separated from the long tooth. (Florida.).....**floridæ** Horn.

Pubescence of elytra uniform, or with at most the faintest perceptible trace of denser spots or lines.

Scutellum transverse, size large—4 mm. (Middle States.)
inornatus Horn.

Scutellum subquadrate or slightly elongate, emarginate at apex; size smaller—always less then 3 mm.

Upper surface entirely pale.

Pubescence uniform or very nearly so throughout, males withfirst central unmodified.

Apex of posterior tibia deeply sinuate within and adjacent to the spur, the latter but little less than half as long as the first tarsal joint. (S. E. California.)
griseolus n. sp.

Apex of posterior tibia feebly sinuate near the spur, the latter scarcely one-third as long as the first tarsal joint. (Texas.) ..... **ochraceus** Schf.

Pubescence feebly condensed in a short line at the middle of the third interspace; first ventral of ♂ with a median flattened area extending the length of the segment and bordered, especially behind, with longer hairs.) Southern California.) ..... **collusus** n. sp.

Prothorax black, the elytra pale, with the suture, especially toward the base, sometimes black or piceous, the dark color often extending along the base and down the sides; pubescence rather dense, luteous or pale ochreous; first ventral of male as in the preceding species. (New Mexico, Southern California.) ..... **perplexus** n. sp.

4. Apical spur of hind tibia short or moderate in length, rarely more than one-fourth as long as the first tarsal joint ..... 5.

Apical spur of hind tibia very long and slender, two-fifths to two-thirds as long as the first tarsal joint.

Robust, elytral intervals with a row of coarse punctures; apical spur of hind tibia about one-half the length of the first tarsal joint; black, irregularly cinereo-pubescent, legs all black (♂), or with the four anterior ones pale (♀). (Georgia, Alabama.) ..... **distinguendus** Horn.

Less stout, elytral intervals without coarse serial punctures.

Apical spur of hind tibia greatly developed, two-thirds as long as the first tarsal joint.

Black, conspicuously variegated with cinereous pubescence, a subtransverse median black spot towards the sides of the elytra; antennæ black throughout or very nearly so. (Massachusetts, District of Columbia, Tennessee.)

longistilus Horn.

Elytral markings as in the preceding, but more feebly contrasting; prothorax more strongly rounded in front; antennæ pale at base. (Southern Arizona.)

pugiunculus n. sp.

Apical spur of hind tibia but little less than one-half the length of the first tarsal joint.

Legs bicolored, elytra with a conspicuous blackish lateral spot. (Southern Arizona.) ..... **biustulus** n. sp.

Legs black.

Elytra with a conspicuous pale line at the middle of the third interspace; antennæ shorter and stouter, joints 4–10 as wide as or wider than long. (New Mexico.)

pulloides n. sp.

Elytral pubescence obscurely mottled, without pale line on third interspace; antennæ more slender, basal six joints at least as long as wide. (California.)

pauperculus Lec.

5. Pubescence varied in color or irregular in distribution, legs black or piceous.....6.
Pubescence varied in color or distribution; legs pale or bicolored..7.
Pubescence uniform in color and distribution; legs pale or bicolored.....8.
Pubescence uniform, legs black.....9.

6. Scutellum oblong, slightly emarginate at apex, moderately grayish pubescent; pubescence cinereous varied with brownish-ochreous, a pale line at middle of third interspace; pygidium of ♂ moderately convex. (California.)

pullus n. sp.

Scutellum small, rounded, densely white pubescent; pubescence finely mottled, whitish; pygidium of ♂ very convex. (New Jersey, Georgia, Missouri, Louisiana.)

alboscutellatus Horn.

7. Femoral denticles distinctly separated from the long tooth.
Terminal joint of antennæ black.
Antennæ shorter, outer joints transverse, size small.
Pubescence predominantly cinereous, mottled with brownish-ochreous, all the femora in great part dark. (California.)

pullus n. sp.

Pubescence predominantly ochreous, feebly mottled, legs pale rufous except the base of the hind femora. (Utah.)

mixtus Horn.

Antennæ longer, outer joints not distinctly transverse, longer than wide in the ♂, size larger.....**inquisitus** n. sp.
Terminal joint of antennæ pale. (United States.)

obtectus Say.

Femoral denticles arising from the posterior side of the long tooth; form robust, antennæ pale throughout or with the intermediate joints a little darker. (Eastern United States.)

hibisci Oliv.

8. Prothorax with a subbasal lateral spot, and elytra with median vitta, reddish. (Arizona.).....**rufovittatus** Schf.
Upper surface entirely black.
Scutellum small, transverse; antennæ entirely pale; eyes emarginate only to middle (last two characters doubtful in *schrankiæ*).
All the femora black, size larger—2.5 mm. (Missouri.)

schrankiæ Horn.

Hind femora only black, size smaller—1.6–1.8 mm. (Southern Arizona.).....**chiricahuæ** n. sp.

Scutellum as long as or longer than wide, antennæ black with basal joints pale; eyes more deeply emarginate.

Form more robust, terminal spur of hind tibia short, first ventral of ♂ unmodified. (Brownsville, Texas.)

aequalis Sharp.

Form more elongate, terminal spur of hind tibiæ moderate, about one-fifth the length of the first tarsal joint; first ventral of ♂ flattened at middle, the flattened area margined with longer hairs. (Western United States.)

aureolus Horn.

9. First ventral of ♂ prominently lobed posteriorly.

Elytral intervals with a conspicuous series of coarser punctures, the striæ also more strongly punctate. (Montreal, Can., Michigan, West Virginia, Arizoua.)...**perforatus** Horn.

Elytral intervals without obvious series of coarser punctures; striæ not distinctly punctate. (New Mexico.)

lobatus n. sp.

First ventral of ♂ without lobiform prominence.

Hind femora with a series of three minute teeth at the middle of the lower margin of the hind femora; antennæ of ♂ long and more strongly serrate. (Western Texas).

subserripes n..sp.

Hind femora without teeth at middle beneath; antennæ of ♂ moderate in length.

Form broader, more rapidly narrowed in front, first ventral of ♂ nearly or quite unmodified.

Pubescence moderately dense, elytral intervals with an evident series of coarser punctures. (Southern Arizona.)

fumatus Schf.

Pubescence relatively sparse, elytral intervals without obvious series of coarser punctures. (Massachusetts, Michigan, Tennessee.) .....**calvus** Horn.

Form narrower, more gradually attenuate in front; first ventral of ♂ flattened at middle, the flattened area margined with longer hairs and with a small foveiform impression at base.

Pubescence moderately dense, usually grayish. (Indiana to California.) .....**fraterculus** Horn.

Pubescence dense, usually luteous or yellowish-gray. (Western United States.).....**aureolus** Horn.

B. protractus Horn.

Antennæ of ♂ a little longer and stouter, last ventral deeply and broadly concave. Spur of hind tibiæ not appreciably different from the other denticles of the tibial apex. The very long last ventral is unique in our fauna. Described

from Lower California, but known to me from the desert region of Southern California and San Antonio, Texas.

B. amicus Horn.

The rather small flattened eyes constitute the most peculiar feature of this species. The scutellum is very small, relativery smaller, I think, than in any other species known to me. The coarse punctures of the pronotum are much finer and sparser than usual.

B. prosopis Lec.

This species agrees fairly well with the three preceding in general form, and especially in the strongly oblique pygidium, but departs from them and agrees with the great majority of this group in having the head punctate and pubescent throughout, the apical spur of the hind tibiæ well developed and the basal joint of the hind tarsi more distinctly arcuate. The scutellum is oblong, emarginate at apex, and more elongate than in any other of our species. I am unable to separate *uniformis* and *desertorum* from *prosopis*. They agree in all essential characters, the former differing merely in being nearly uniformly pale, and the latter in its smaller size. All these forms were described at the same time by LeConte, who remarks that they occurred together in the Colorado Desert breeding in the pods of *Prosopis* and *Strombocarpus*.*

B. bisignatus Horn.

The most important character of this specie—viz., the large eyes and narrow front, are not alluded to at all by Horn in his description. Two examples, ♂ and ♀, in my collection, taken at Albuquerque, New Mexico, by Mr. Wickham, were compared by me with Horn's type some years ago and found

* It happens that the description of *uniformis* precedes that of *prosopis* on the same page, yet I have chosen to use the latter name for the species, as being more appropriate and because it describes the usual form of the species. This course does no injustice to the describer, creates no confusion, and is a manifestly sensible one. I realize, however, that sooner or later some one, staunch in his belief that man was made for the Sabbath, will reverse the synonymy.

to be identical. If I am correct, Mr. Schaeffer's specimens of *bisignatus*, which he says do not differ from *exiguus*, must be incorrectly determined. In my pair the antennæ of the male are much longer and stouter, joints 1–4 and the terminal joint pale. The eleventh joint is wanting in the female, but is probably colored as in the male. Horn describes the antennæ as black with basal joints rufous.

B. floridæ Horn.

The type of this is strikingly suggestive of *exiguus*, and it may be an unusually large example of the latter with two instead of the typical three denticles on the hind femur. A further careful comparison with typical *exiguus* is necessary before pronouncing them the same.

B. griseolus n. sp.

Moderately robust, rufotestaceous, lower surface darker rufous or picescent except posteriorly, antennæ and legs entirely rufous; pubescence rather dense, uniformly yellowish-gray. Antennæ not conspicuously incrassate externally, joints 6–10 subequal in width and all nearly or quite as long as wide. Eyes moderately prominent, front slightly wider than the ocular width, scarcely or feebly carinate, closely finely punctate, occiput with piceous shade at middle. Prothorax wider than long, sides broadly arcuately convergent from base to apex; surface moderately coarsely not closely punctate. Elytra as wide as long, sides distinctly divergent posteriorly; striæ fine, obsoletely punctate, intervals flat without distinct sculpture; humeral callus slightly or distinctly darker, suture and side margin sometimes narrowly dusky. Hind thighs rather stout, armed on the inner edge near the tip with a long acute tooth and two rather strong denticles approximate to the tooth. Hind tibia finely carinate externally, apical spur nearly half as long as the first tarsal joint. Length, 2.5–2.8 mm.; width, 1.5–1.7 mm.

Described from seven examples taken by Dr. Fenyes at Yuma, both on the Arizona and California sides of the river.

This species would by Horn's table come next to *uniformis*, but the prothorax is wider with sides more arcuate, scutellum less elongate, pygidium less oblique, not bi-impressed at apex, last ventral shorter, tibial spur much longer. The pubescence is perfectly uniform in color and density throughout.

B. ochraceus Schf.

This species is described by its author as being clothed with uniform pale yellowish pubescence. A specimen kindly sent me for examination shows faint but unmistakable traces of three lateral darker areas on the elytra, becoming gradually evanescent inwardly. Examples in my collection from Columbus, Texas, which I think are unquestionably identical show the markings more clearly, and in one large female with the derm of darker shade, the elytral pubescence is sharply and distinctly tessellate with pale yellow and brown. In consequence of this evident variability in color I have tabulated the species in two positions. The relative lengths and widths of the prothorax and elytra are quite inexact as given in the description, the longer dimension being overestimated in each instance. In the specimen at hand the prothorax is but slightly over one-fourth wider than long, and the elytra are two-fifths longer than the basal width.

B. collusus n. sp.

Form nearly as in *aureolus* and *pauperculus*. Piceous, elytra pale rufotestaceous, the prothorax varying to dark rufous or rufo-piceous, the elytra sometimes with the suture narrowly blackish, humeral callus blackish at summit. Pubescence pale ochreous, moderately dense, not or but feebly variegated. Antennæ piceous, basal four joints pale, not very strongly incrassate, the outer joints distinctly transverse and feebly subserrate. Eyes not very prominent, separated on the front by a distance which is barely equal to their own width. Front not carinate, finely punctate; occiput more closely and less finely punctate. Prothorax conical, a little wider than long, sides slightly sinuate behind and a little rounded anteriorly; surface with moderately numerous coarse punctures. Elytra a little widened behind, finely striate, intervals minutely subrugosely punctate. Pygidium distinctly rather closely punctate. Legs pale rufotestaceous, the last two tarsal joints blackish, the extreme apex of the hind tibiæ and base of hind femora sometimes blackish. Hind thighs moderately stout, armed with a tooth and two small denticles. Apical spur of hind tibia less than one-fourth as long as the first tarsal joint. Lenth, 1.8–2.5 mm.; width, 1.1–1.4 mm.

The pubescence is rather dense on the prothorax and pygidium, slightly less so on the elytra, where the surface color becomes somewhat more evident. In some specimens there is a slight trace of a paler line at the middle of the third

interspace, and the faintest perceptible indications of the other marking that usually accompany this; in these there is also a more or less evident pale median line on the prothorax.

The type is one of a series of four specimens taken at Deep Creek—6500 feet—in the San Bernardino Mountains in California.

The affinities of the present species are with *mixtus* and *aureolus*, and it may prove to be a variety of one or the other. For the present, at least, *mixtus* may be separated by the entirely black upper surface, and *aureolus* by the slightly denser pubescence, which is always uniform in color throughout; in typical *aureolus* the legs are black.

B. perplexus n. sp.

Form not very robust, nearly as in *aureolus;* black, the elytra pale rufotestaceous with the tip of the humeral umbone and frequently the base and more or less of the suture and side margins blackish; legs pale, the tarsi in great part, and sometimes the basal parts of the femora blackish. Pubescence yellowish cinereous, rather dense, and uniform throughout. Antennæ black, the basal four joints pale, outer joints moderately transverse, scarcely serrate. Head finely sparsely punctate and dull, front about equal in width to the eyes. Prothorax a little wider than long, form and sculpture as in *aureolus*. Scutellum oblong, a little elongate, emarginate apically. Elytra a little longer than wide, gradually wider apically, finely striate, striæ not distinctly punctate, intervals finely rugose-punctate. Pygidium moderately oblique in the female, less so in the male, the latter with the first ventral a little more pubescent at middle and with a very small basal rounded feebly impressed fovea, which is more densely sculptured and pubescent. Hind femora with a small acute tooth and one or two very small denticles. Apical spur of hind tibia about one-fifth the length of the first tarsal joint. Length $1\frac{3}{4}$–$2\frac{1}{4}$ mm.

The type is from Alburquerque, New Mexico (Wickham). With it are associated specimens from Highrolls, New Mexico, Bright Angel, Arizona, Palm Springs, California, and Claremont, California.

This species is closely allied to *aureolus* and *collusus*, differing from the former in scarcely any respect except color, and from the latter by its black thorax, uniform pubescence, and smaller size. Whether these differences are specific it is quite impossible to say, but they may well be recognized for the present by distinctive names.

B. distinguendus Horn.

Dr. Horn does not mention in his description of this species the very long spur of the hind tibia. The fourth antennal joint is abruptly much larger than the third, being nearly twice as wide as the latter, and subequal in length to the second and third together, at least in the male; no females are at hand. The first ventral is faintly impressed near the base in the male. The general form and mottling of the upper surface suggest *hibisci*, but the latter is at once distinguished by the short tibial spur and smaller fourth antennal joint.

B. pugiunculus n. sp.

Very closely allied to *longistilus*, but differing in so many of the smaller details that a specific name seems warranted. The size and form are nearly identical in the two species, except that in the present one the sides of the prothorax are more strongly arcuate anteriorly. The elytral pattern is of the same type in both, but is here much less sharply defined, owing to the more feebly contrasting colors of the pubescence which is gray and pale brown instead of gray and blackish brown as in *longistilus*. The spots of pale hairs on the prothorax are correspondingly indistinct and the thoracic punctuation is rather less dense in *pugiunculus*. Antennæ with basal four joints pale, the outer joints distinctly less incrassate than in *longistilus*. Tarsi blackish, the legs otherwise rufous, except the base of the hind femur. Spur of hind tibia three-fifths as long as the first tarsal joint, the latter evidently though not greatly longer than the following joints together. In *longistilus* the antennæ are entirely black, legs less completely pale, spur of hind tibia and basal joint of tarsus each relatively a little longer.

Chiricahua Mountains, Arizona. A single example collected and given me by Mr. V. L. Clemence.

B. biustulus n. sp.

Form and size of *longistilus*, black, legs bicolored, the apex of the front and middle femora, front and middle tibiæ, and hind tibiæ in apical half, pale, otherwise piceous. Surface moderately densely cinereous pubescent, varied with ochreous or brownish in much the same fashion as in the two preceding species. Antennæ not passing the humeri, piceous, basal four joints pale, fifth joint as long as wide, 6–10 transverse, the outer ones quite strongly so. Head closely punctate, front not at all carinate, eyes separated by a distance which is fully as great as their own width. Prothorax with a narrowly divided brownish-ochreous longitudinal median stripe. Elytra with a pale line at the middle of the third interspace, before and behind this rather faint darker spots, and opposite it externally a larger transverse blackish brown spot nearly reaching the side margin, each elytron at apex also with two of the more obscure darker spots. Hind thighs

rather stout, armed with an acute tooth, and two denticles well separated from the tooth; spur of hind tibia nearly half the length of the first tarsal joint; tibia distinctly finely carinate externally for its entire length. Length, 1.7 mm.; width, .9 mm.

Santa Rita Mountains, Arizona (Snow).

Closely allied to *pauperculus* and *pulloides* in general structure and vestiture, and especially in the long spur of the hind tibia, but of more striking appearance because of the conspicuous blackish sublateral elytral spot. From *pulloides*, to which it is closest, it differs, furthermore, in its shorter antennæ (the types of both species being apparently males), bicolored legs and distinctly stouter hind femora. The hind tibiæ are in *biustulus* evidently, though finely, carinate on their outer face throughout their length; in *pulloides* the carina is evident only toward the apex, and in *pauperculus* is nearly or quite lacking.

B. pulloides n. sp.

Strikingly similar to *pullus* in form, size and markings. Entirely black, pubescence cinereous, somewhat obscurely mottled with brownish-ochreous. Antennæ rather long, passing the elytral humeri, joints 4 and 5 as wide as long, 6–10 transverse, scarcely serrate. Head dull, alutaceous, front finely not closely punctate, occiput more densely punctured; eyes separated by slightly less than their own width. Prothorax wider than long, sides moderately convergent from the base to beyond the middle, thence rounded and more strongly convergent to apex; moderately coarsely not closely punctate, cinereo-pubescent with a longitudinal median stripe of brownish-ochreous occupying the middle third and divided by a feeble imperfect longitudinal line of pale hairs. Elytra mottled nearly as in *pullus*, a somewhat conspicuous pale line at the middle of the third interspace, and before, external to and behind this spots of brownish-ochreous. Pygidium convex and feebly oblique, apex inflexed, rather densely punctate, unevenly cinereo-pubescent. Legs black throughout, hind femora not very stout, hind tibiæ feebly carinate externally, the terminal spur one-half the length of the first tarsal joint. Length, 1.8 mm.; width, 1.1 mm.

Pecos, New Mexico. One male, received from Professor Cockerell.

This species differs from *pullus* most noticeably in its entirely black legs and antennæ (perhaps not constant) and the much longer spur of the hind tibiæ. In the latter particular it agrees with *pauperculus*, with which I had at first as-

sociated it, but the latter species is still more feebly mottled, never in my experience with a conspicuous pale line on the third interspace, the antennæ pale at base and more slender, with at least the first six joints as long as or longer than wide. The hind femora in *pulloides* are armed with a small acute tooth and two very small denticles.

B. pullus n. sp.

Form and size of *pauperculus*, *aureolus* and *mixtus;* pubescence not very dense, cinereous mottled with brownish-ochreous. Prothorax with four discal brownish spots which are often obscurely defined. The most conspicuous markings on the elytra consist of a pale line at the middle of the third interspace, before, behind and external to which are oblong brownish spots, the latter transverse. Antennæ passing the humeri, stout, black, basal three or four joints pale; joints 2 and 3 a little longer than wide, 4 as wide as long, 5 distinctly transverse, 5–8 gradually wider, 8–10 equal, nearly one-half wider than long. Head alutaceous, finely punctate, eyes moderately prominent, separated by a little less than their own width; front not distinctly carinate, the median line, however, a little prominent in certain lights. Prothorax wider than long, sides feebly sinuate and divergent behind, surface coarsely but not densely punctate. Elytra about one-fifth longer than wide, sides broadly arcuate and a little divergent behind; striæ fine, intervals flat, polished, with fine punctures which tend to form rather feeble transverse rugæ. Pygidium oblique basally, convex and vertical in apical half, the tip a little inflexed, pubescence mottled, brown and cinereous, punctuation fine, subrugose. Legs sometimes entirely piceous, more often with the thighs testaceous at apex, and all the tibiæ testaceous in apical half or more. Hind thighs with a small acute tooth and two denticles which may be quite distinct or nearly obsolete. Hind tibiæ very feebly carinate on the outer face, the terminal spur slender and about one-fourth the length of the first tarsal joint. Length, 1.5–1.9 mm.; width, .8–.9 mm.

California; Ojai (type), San Diego, Catalina Island.

Closely allied to *mixtus* apparently, the latter differing in having the vestiture predominantly ochraceous and just perceptibly mottled, the legs pale rufous, except the base of the hind femora. *Pauperculus* is more obscurely mottled, and has more slender antennæ, and the terminal spur of the hind tibiæ is about twice as long.

B. inquisitus n. sp.

Elongate oval, piceous black, basal four joints of antennæ pale, legs bicolored, the front and middle femora in less, and the hind femora in more than basal half, piceous; the tibiæ pale; terminal joint of front

and middle tarsi, and the hind tarsi in great part, blackish. Pubescence not very dense, cinereous and brown or brownish-ochreous, obscurely mottled on the elytra, the pale hairs forming a short feebly defined line at the middle of the third interspace, and two very obscure irregular transverse bands before and behind the middle, the brownish spots consisting of three on the disk of each elytron surrounding the pale line of the third interspace, and three larger sublateral spots, all obscurely defined. Antennæ unusually long and slender, attaining the middle of the elytra, feebly incrassate, all the joints longer than wide, the terminal one very little longer than the tenth. Eyes moderately prominent, separated by about their own width. Head densely punctate, a small smooth spot at the middle of the vertex, front not carinate. Prothorax moderately transverse, conical, sides broadly arcuate, feebly sinuate basally, clothed rather thinly with brownish-ochreous pubescence which is not appreciably mottled, the coarse punctuation strong and close. Elytra distinctly longer than wide, sides broadly arcuate, striæ fine, feebly punctured, intervals finely subrugosely punctate. Pygidium oblique basally, vertical in apical half, pubescence cinereous, rather sparse, a little condensed along the middle, punctuation distinct but not deep. Hind thighs rather slender, armed with a tooth and two denticles; hind tibiæ not at all carinate on the outer face, the terminal spur scarcely one-third the length of the first tarsal joint. Length, 3 mm.; width, 1.6 mm.

California (Deep Creek, San Bernardino Mountains—6500 feet).

The type above described is a male. With it I have placed a specimen from Kings River Cañon which looks very similar and is probably identical. This latter is a female, and differs in being a little stouter, the smooth spot on the vertex obsolete, the antennæ a little shorter, the ninth and tenth joints nearly or quite as wide as long, the spur of the hind tibia slightly more than one-third the length of the first tarsal joint. This species looks like a large *pauperculus*, the obscure markings being of the same type, but it may be at once separated from the latter species by its bicolored legs and the very elongate antennæ and shorter hind tibial spur, especially of the male.

B. chiricahuæ n. sp.

Form not very robust, nearly as in *aureolus* and *fraterculus*, black, antennæ entirely rufotestaceous, front and middle legs except the tarsi and the extreme base of the middle femora, rufotestaceous; hind legs black. Pubescence not very dense, uniformly cinereous throughout. Antennæ as long as or slightly longer than the head and prothorax,

moderately incrassate, scarcely serrate, the penultimate joints about one-half wider than long. Eyes rather large, the emargination extending beyond the middle, separated by a distance evidently less than their own width. Head finely closely punctate, front feebly obtusely carinate. Prothorax only about one-fourth wider than long, sides broadly arcuately convergent, faintly sinuate near the base, surface coarsely rather closely punctate. Scutellum slightly transverse, more densely pubescent. Elytra slightly longer than wide, sides moderately arcuate, humeral umbone not prominent; striæ fine, scarcely punctured; intervals flat, finely subrugosely punctate. Pygidium vertical, convex, tip inflexed, punctuation somewhat coarse but vague. Hind femora rather stout, armed with an acute tooth and two rather strong denticles closely approximate to the tooth. Apical spur of hind tibia short. Length, 1.6–1.65 mm.; width, 1 mm.

Chiricahua Mountains, Arizona. Two examples, probably both males, collected and given me by Mr. V. L. Clemence.

The present species is closely related to *schrankiæ*, and may possibly not be distinct. The latter spcies is from Missouri, is considerably larger (2.5 mm. according to Horn), and has all the femora black. A specimen from Williams, Arizona, in my collection is probably properly placed with the present species although the antennæ are pale at base only.

B. perforatus Horn,

As in *distinguendus* the antennæ of the male are more than ordinarily long and stout, the fourth joint much longer and wider than the third. The male in *perforatus* has the first ventral concave at middle and with a well-marked lobe bearing longer hairs at the middle of the posterior margin. In the female the first ventral suture is posteriorly arcuate at middle. A similar male character exists only in *lobatus* so far as I know. The coarse serial punctures of the elytral intervals, so conspicuous in *perforatus*, and only a little less so in *distinguendus*, ally these two species and distinguish them from all neighboring forms.

B. lobatus n. sp.

Elongate ovate, black, uniformly moderately densely cinereous pubescent, very similar in nearly all respects to *fraterculus* and *aureolus*, and only separable with certainty by the abdominal sexual characters of the male. In this sex the flattened area of the first ventral is distinctly longitudinally concave, entirely devoid of any basal fovea or small densely punctured area (which is characteristic of *fraterculus* and *aureolus*), and with the apex produced in a thin slightly deflexed laminiform lobe which is narrowly truncate at tip. The antennæ are long and subserrate, nearly attaining the middle of the elytra, the first

three joints paler below, piceous above, the fourth one-half longer than, and nearly twice as wide as the third. The eyes are widely separated, the front feebly obtusely prominent and impunctate along the median line. Length, 2.3 mm.; width, 1.35 mm.

Los Vegas Hot Springs, N. Mex. (Barber and Schwarz).

With the male type I have placed a smaller female specimen from the same locality, which from its association probably belongs here, but is not different apparently from ordinary *aureolus*.

B. subserripes n. sp.

Moderately robust, form nearly as in *fraterculus*, black, uniformly, moderately densely cinereo-pubescent. Antennæ (♂) long and stout, reaching the middle of the elytra; basal four joints piceous, paler beneath, together but little longer than the fifth; second obconical, about as wide as long, third a little transverse, fourth very short and strongly transverse, fifth abruptly, very much larger, about as wide as long, 6–10 similar, subequal or slightly decreasing in width, subserrate. Eyes moderate, emarginate for two-thirds their length, separated by fully their own width. Head finely, closely punctate and dull. Prothorax conical, a little transverse, sides nearly straight, surface coarsely rather densely punctate. Scutellum slightly elongate, emarginate at tip, more densely pubescent. Elytra as wide as long, finely striate, intervals finely rugosely punctate. Pygidium a little more densely pubescent, subvertical, convex, moderately coarsely, but not deeply punctate. Hind femora thick, armed near the knee with an acute tooth and two somewhat distant denticles, and also on the inside, near the middle of the lower margin a series of three distant, small, acute teeth, directed backward. Apical spur of hind tibia slender and about one-third as long as the first tarsal joint. The female differs from the male only in the shorter antennæ, which are less dilated and more feebly serrate externally. Length, 1.75–2.5 mm.; width, 1.15–1.35 mm.

Ysleta, Texas.

This species is quite similar in appearance to *fraterculus*, but differs from it in the longer and stouter male antennæ, and from all species known to me except *musculus*, by the small acute teeth at the lower margin of the hind femora.

B. fumatus Schf.

In a male of this species, sent me by Mr. Schaeffer, there appears to be on the first ventral a very small, feebly impressed fovea, which is more finely, densely sculptured and pubescent; there is, however, no apparent flattening of the segment, nor any trace of the longer hairs which are present in *aureolus* and several allied species.

B. fratereulus Horn.

Typical specimens of this and *aureolus* are distinguished as indicated in the table; there is, however, in my collection, every imaginable intermediate form, and I do not think it possible to satisfactorily separate the two. The name *aureolus* takes precedence.

Mr. Schaeffer has recently written *aureolus* as a variety of *pauperculus* Lec. This is incorrect, and is probably due to an erroneous determination of the latter, which may always be separated from *aureolus* by its relatively long posterior tibial spur, and its obscurely mottled pubescence.

Group VIII.

The four species here tabulated agree in having typically a tooth and three denticles on the inner margin of the hind femur. Aside from this the group has no other claim to integrity, and even in this respect *exiguus* often fails. This latter species is indeed closely allied to the *aureolus* series of the preceding group. The form is the same, the fifth and sixth elytral striæ are shortest, and the first ventral of the male is similarly modified. In *musculus* and *placidus* striæ 3 and 4 are shortest, as is the rule in the groups preceding the last. *Musculus* is in several respects peculiar and not very closely allied to any other species. *Rufescens* is unknown to me except by description. Our species thus far referred to the present group may be distinguished as follows:

Color more or less rufous, legs rufous, apical spur of hind tibia of moderate length.

Smaller and less robust, the head, prothorax and more or less of the underside blackish; elytra reddish-brown with marginal dark markings; pubescence condensed in short longitudinal lines. (Florida to California.) .....**exiguus** Horn.

Black, elytra with margin, apex, and longitudinal vitta reddish. (Brownsville, Texas.).....**rufescens** Schf.

Larger and more robust, entirely rufous, elytra with two transverse series of small brown spots on the alternate intervals. (Texas, Arizona.) .....**placidus** Horn.

Black, hind femora and tibiæ black, front and middle legs and hind tarsi pale yellow; inner apical spur of hind tibia very short. (Massachusetts to Georgia and Michigan.)...**musculus** Say.

B. exiguus Horn.

Specimens before me from Florida, Ohio, Missouri, Arizona and California do not appear to be separable, and indicate this to be a variable and widely dispersed species. According to description, the types have the head and thorax black and the sides of the elytra narrowly so, but the color may become almost entirely rufous, in which case a small spot on the head, the tip of the humeral callus and the narrow sutural interspace usually remain blackish. In the Arizona and California specimens the spur of the hind tibiæ is noticeably though not greatly longer than in eastern examples, but no other difference of moment has been noticed. The species was described from two Kansas specimens, but on attempting to compare with these some years ago I found none such in the Horn collection; in fact there were no specimens on the label, but beside it were several Arizona ones which were perhaps placed there tentatively. The number of denticles on the hind femur may be either two or three, and these vary much in development. As indicated previously, it is very doubtful if *floridæ* is distinct from *exiguus*, all of whose essential characters are those of the preceding group.

B. musculus Say.

One of the most distinct species in our fauna, and most of its pecularities have apparently escaped record. Say describes the antennæ as yellow at base and tip, and piceous in the middle. Horn says they are usually colored thus, but are often entirely pale. Judging from the material before me this difference is purely a sexual one, the males having entirely yellow, and the females bicolored antennæ. The eyes are unusually deeply emarginate, the tip of the abdomen is deflexed in the male, the hind thighs are minutely serrulate at the middle beneath (observed elsewhere only in *subserripes*), and the hind tibiæ are finely granulato-serrate posteriorly throughout their length. The contrast between the bright, yellow hind tarsus and the black tibia and femur is striking and unusual. The three denticles of the hind femur are more distant than usual from the anterior tooth, and between them may be seen in some specimens a fourth very small denticle.

Group VIIIa.

Following the Horn system of classification the three following species must constitute a separate group between VIII and IX, because of the presence of four denticles in addition to the principal tooth of the hind femur. These three species may be separated as below.

Second antennal joint about three-fifths as long as the third, body throughout piceous, pubescence dark brown variegated with whitish and ochreous spots and lines; Size very large—5–14 mm. (Brownsville, Texas; Lower California.) **julianus** Horn.

Second and third joints of antennæ subequal, color brown or ferruginous.

Pubescence brown, whitish and ochreous, elytra with a conspicuous ochreous line at the middle of the third interspace; length 4⅓ mm. (Arizona.) ..... **ochreolineatus** n. sp.

Pubescence of elytra luteous, either nearly uniform or more often with some denuded spots which appear darker; length 3 mm. (Brownsville, Texas.)..... **quadridentatus** Schf.

B. julianus Horn.

The dentiform elevations at the base of the elytra, on which Mr. Schaeffer was inclined to lay some stress, are by no means peculiar to this species, although more evident than usual because of its large size. I have observed them in *ochreolineatus*, *chinensis*, *protractus*, *ulkei*, *prosopis*, *amicus* and *placidus*. They arise at the base of the intermediate striæ and vary much in their development individually.

B. ochreolineatus n. sp.

Robust, reddish-brown, irregularly marmorate with cinereous and ochreous or brownish pubescence, so disposed as to leave at the middle of each elytron an irregular transverse dark area which is wider externally. There is a conspicuous yellow line at the middle of the third interspace, a shorter one opposite the anterior end of this on the fifth interspace, and three small basal spots of same color on each elytron. Prothorax with slightly yellowish cinereous pubescence at sides and a rather narrow line of ochreous hairs at middle. Antennæ (♀) rufous, a little darker apically, scarcely reaching the base of the elytra, strongly incrassate, scarcely serrate, penultimate joints about twice as wide as long. Eyes moderately large, emarginate to middle, separated by a distance which is about four-fifths their own width. Head densely punctate, median line of front carinate and narrowly smooth. Prothorax a little wider than long, sides strongly convergent and nearly

straight, surface rather densely coarsely punctate, the interspaces polished and scarcely punctulate. Scutellum short, transverse, moderately pubescent. Elytra as wide as long, humeri well defined, sides nearly parallel and broadly arcuate, striæ fine, distinctly, rather closely punctate, intervals finely punctulate, each with a series of distant, larger punctures. Pygidium oblique, clothed rather densely with ochreous pubescence, surface closely, coarsely punctate. Legs rufous, posterior thighs moderately stout, armed with a long tooth and four well developed acute denticles; apical spur of hind tibia about one-fourth the length of the first tarsal joint. Length, 4.6 mm.; width, 2.75 mm.

Jerome, Arizona. A single female example collected at light, and sent to Dr. Fenyes, who kindly permits me to retain the type.

Only two other species in our fauna are known with four denticles on the hind femora, vix.: *julianus* and *quadridentatus*. *Julianus* is blackish with more variegated pubescence of brown, white and ochreous, but without conspicuous yellow line on the third interspace, the pygidium with white basal spots, the antennæ with joints 8–10 abruptly blackish. *Quadridentatus* is much smaller (3 mm.), and according to description must be very much more elongate, the elytra being nearly twice as long as wide, with the sides posteriorly diverging.

Group IX.

The species of this group are small or minute, and characterized by the presence of two or three small denticles only on the hind femur. Horn placed here *macrocerus* and *seminulum*. The latter and *atomus*, described below, conform to this description in having two very small subequal well separated denticles, which in the smallest examples become so rudimentary as to be detected with difficulty.

Flavicornis Sharp, which has in recent years been taken in Arizona and Lower California, is described as having the hind femur devoid of teeth or denticles. This may be true of some specimens, but there are examples before me in which either one or two very minute rudimentary denticles are present, and there can be no doubt that the species is more properly placed here than in Group V, where it looks

much out of place. The only specimen of *macrocerus* at hand has a distinctly longer anterior tooth and two denticles and would naturally be referred to Group VII.

Schaeffer remarks that he has observed in both *macrocerus* and *compressicornis* that the anterior denticle is sometimes longer than the others, and I think there is little doubt that these two species would be more appropriately grouped with the species having a tooth and two denticles, though their antennal characters are such as to make them exceptional in that series. *Seminulum* and *atomus* on the other hand though more decidedly separated from Group VII by their femoral denticles are really closely allied to some of the smaller species of that group, small specimens of *aureolus* being, indeed, very similar to *seminulum*.

Antennæ longer than the entire body, serrate, all the joints except the second elongate, black, sparsely irregularly clothed with white pubescence. (New Jersey, District of Columbia, Tennessee.).....**macrocerus** Schf.

Antennæ passing the middle of the elytra, scarcely serrate, outer joints quadrate or transverse; black, more densely and uniformly pubescent. (Brownsville, Texas.)..**compressicornis** Schf.

Antennæ not or but slightly passing the base of the prothorax.

Legs and antennæ entirely yellow; pubescence of upper surface uniform, spur of hind tibia short. (Brownsville, Texas; Lower California.).....**flavicornis** Sharp.

Legs and antennæ black; pubescence more or less distinctly marmorate on the elytra with small subdenuded spots.

Coarse punctures of the pronotum very obvious, spur of hind tibia about one-fourth as long as the first tarsal joint. (Florida, Kansas.).....**seminulum** Horn.

Coarse punctures nearly wanting on the pronotum; spur of hind tibia two-fifths as long as the first tarsal joint. (Massachusetts, New York.).....**atomus** n. sp.

B. atomus n. sp.

Form rather stout, entirely black, rather thinly and unevenly clothed with cinereous pubescence, producing a finely marmorate effect, especially on the elytra; punctuation throughout very fine, sparse and indistinct. Eyes moderately prominent, separated by a distance which slightly exceeds their own width. Front not in the least carinate. Antennæ rather short, moderately incrassate, joints 6–10 transverse. Prothorax moderately transverse, sides feebly arcuate. Elytra about as wide as long, a little wider behind. Pygidium subvertical. Hind

thighs with two very minute, equal, well separated denticles; hind tibia not visibly carinate externally, the terminal spur about two-fifths the length of the first tarsal joint. Length, 1.1–1.15 mm.; width, .7–.8 mm.

Hyannis (Cape Cod), Mass.; Newark, New Jersey. The type is one of a considerable series taken by Mr. Frederick Blanchard at the first named locality.

The smallest species known to me, though closely approached in size by *seminulum*, which is nearly related and much resembles it. The latter may, however, be at once distinguished by the much shorter spur of the hind tibia, and the obvious coarser punctures of the pronotum; the form is also slightly more elongate, and the pubescence is is not quite so distinctly marmorate. In his description of *seminulum* Horn alludes to the presence of a series of distant coarse punctures on the elytral interspaces, This appearance is due chiefly, if not entirely, to interruptions in the pubescence, there being scarcely a trace of any such punctures when the surface is denuded.

OTIORHYNCHIDÆ.

EUPAGODERES Horn.

So far as our species are concerned, the members of this genus are at once separable from those of *Ophryastes* by the prothorax being narrower and devoid of tuberosities at the sides. Dr. Sharp rejects this character as unreliable or insufficient, but remarks that they may be satisfactorily separated by the presence (*Eupagoderes*) or absence (*Ophryastes*) of adhesive pubescence from the lobes of the third tarsal joint. I have, however, already pointed out* that this character is largely, if not entirely, a sexual one, common to species of both genera. In this connection it is a significant fact that *wickhami* described by Sharp as an *Ophryastes* is really a *Eupagoderes*. The tarsi in *Ophryastes* are, it is true, generally if not always narrower than in *Eupagoderes*, sex for sex; but the degree of dilatation is variable in both genera, and judged by this character alone, many females of *Eupagoderes* would easily pass for *Ophryastes*. Notwithstanding this fact

* Trans. Am. Ent. Soc., XXXIII, p. 260.

Mr. W. D. Pierce in a recently published list* of the National Museum material uses the following characters in his key to the genera of the group *Ophryastes:*

Third tarsal joint broadly bilobed and much wider than the second, pubescent beneath ..... **Eupagoderes.**

Third tarsal joint not broadly bilobed, hardly wider than the second, emarginate at apex, not pubescent beneath.... **Ophryastes.**

The first of these diagnoses would exclude all females of *Eupagoderes*, and the second would shut out the males of at least some of our *Ophryastes*. Further study of Mr. Pierce's paper leads me to suspect that certain records are based on erroneous identifications in this group. *Argentatus* and *desertus* are really quite distinct species, and Mr. Pierce's statement that the two appear to be identical can hardly be explained in any other way. The remarks about *wickhami* indicate a failure to properly identify Sharp's species, nor is it likely that *speciosus* occurs at either Phœnix or Yuma, Arizona.

The four species described below are true *Eupagoderes*.

E. nivosus n. sp.

Elongate oval, very convex, very densely clothed with white scales, with or without faint mottling of darker scales along the striæ; setæ of upper surface spare and exceedingly minute, longer and more numerous on the legs and ventral surface. Head not appreciably transversely impressed at base of rostrum, the latter convex, trisulcate, all the grooves fine, the lateral ones rather long, nearly straight; median groove terminating in a small fovea in the position of the usual transverse impression. Prothorax a little less than one-half wider than long, widest at middle, sides rather strongly evenly arcuate, not distinctly constricted, but with a shallow apical marginal groove and a basal marginal impressed line which is deeper at sides; surface finely rather sparsely irregularly punctate, a little more coarsely so laterally; median impressed line fine. Elytra oval, without humeri, widest near the middle, twice as long, and one-fourth wider than the prothorax (♂), a little more inflated in the ♀; striæ fine, somewhat impressed and finely punctate, intervals feebly convex and nearly equal, the first and fourth slightly narrower than the second and third. Beneath and legs white, all the tibiæ denticulate within, the front ones most conspicuously so. Length 12–15 mm.

Phœnix, Arizona; a single pair.

* Proc. Nat. Mus., Vol. 37, p. 341.

The male is pure white throughout; the female is feebly mottled with faint oval annular spots, each centered on a strial puncture. In the female the median sulcus of the rostrum is longer than in the male, extending somewhat indefinitely upon the front.

By Horn's table *nivosus* would be associated with *speciosus* and *sordidus*. It is much smaller than the former and larger than the latter, and differently colored from either. There is little doubt that this is the species referred to in Mr. Pierce's list as *speciosus*.

E. marmoratus n. sp.

Similar in form to the preceding, densely clothed with ashy white and blackish plumbeous scales, strongly mottled on the elytra, the dark spots centered about the strial punctures, especially in the ♀, the first, third and fifth intervals in this sex with finely intermixed pale brown scales; prothorax with broad lateral and median plumbeous vittæ alternating with narrower irregular pale vittæ. Head without transverse impression, rostrum strongly trisulcate, the median groove very long and deep, reaching a point on the vertex opposite the upper margin of the eyes; lateral grooves narrower than the median one, but deep and moderately long, nearly straight. Prothorax a little less than one-half wider than long, widest before the middle, sides strongly rounded, the margin uneven from the coarseness of the lateral punctures; disk coarsely rather closely punctate, median sulcus well marked, entire. Elytra not very much wider than the prothorax in the ♂, more broadly oval in the ♀, the form proportions and sculpture as in the preceding species. Length 13–15 mm.

This species was taken in some numbers by Mr. Wickham at Tucson, Arizona. The type is a ♂ from an unrecorded locality in Arizona.

Marmoratus is most closely related to *nivosus*, differing in its strongly mottled scaly vestiture, more deeply sulcate beak, much more coarsely sculptured prothorax, which is widest in front of the middle. Some specimens of *argentatus* are similarly mottled, but this has the head transversely impressed at the base of the beak, and the prothorax much narrower. The Tucson examples show some variation in the development of the rostral sulci, these being finer in some than in the type.

E. aridus n. sp.

Elongate oval, convex, densely clothed with ashy scales having a faint flesh tint, and obscurely clouded with pale plumbeous chiefly along the third and fifth elytral intervals; prothorax with a narrower median and wide lateral darker vittæ, which are rather obscure. Rostrum with transverse basal impression, median sulcus broad and vague, lateral sulci short, convergent behind, vertex flattened, finely carinate at middle. Prothorax barely one-third wider than long, widest at middle, sides evenly rather strongly arcuate, apical marginal impressed line obsolete, basal marginal line feebly impressed, distinct only at sides; surface with unevenly distributed larger and smaller punctures, median line consisting of a series of more or less coalescent larger punctures. Elytra oval, without evident humeri, widest at middle, nearly two and one-half times as long, and slightly more than one-half wider than the prothorax; striæ fine, with fine rather distant punctures; intervals nearly flat on the disk, broadly convex laterally; setæ spare and short. Tibiæ not denticulate within. Length 14 mm.

Described from a single male specimen taken by Mr. Ricksecker in the hills on the western border of the Colorado Desert, California.

This species is nearest *varius*, differing from the single example of the latter species before me in the larger size, peculiar tint of the pale scales, finely carinate vertex (evenly convex in *varius*), somewhat less coarsely punctate prothorax, and more finely punctate elytral striæ.

E. mortivallis n. sp.

Elongate oval, clothed with silvery white scales, median impressed line of prothorax and a lateral vitta of lead-black scales, middle of the prothoracic disk and sutural interval of elytra more or less fulvous or pale yellowish-brown; intervals 2–4–6 slightly narrower and with darker scales, giving a faint vittate appearance. Beak transversely impressed at base, median sulcus moderate, lateral sulci rather short, subparallel, broadly arcuate. Prothorax one-third to two-fifths wider than long, widest at middle, sides broadly arcuate, basal and apical marginal grooves obscure on the disk, becoming sharply defined at sides, disk very finely not closely punctate, more coarsely punctured in the dark lateral vittæ. Elytra about three times as long as the prothorax, and about one-half longer than wide; striæ very fine, feebly punctured, intervals flat, setæ very sparse and minute. Legs and lower surface silvery white, tibiæ very finely denticulate within. Length 12–18 mm.

Death Valley, California (Koebele).

This fine species would fall near *geminatus* by Horn's table, but this latter species differs in its more transverse and

more coarsely punctured prothorax, with the sides strongly rounded, the less fine and more coarsely punctate elytral striæ, and the well defined elytral vittæ. I have seen examples of *desertus* which much resemble the present species, but these may be at once separated by the broader more impressed elytral sulci, which are much more strongly punctured.

In the following table of our species of *Eupagoderes* thus far described, *plumbeus* Horn, has been omitted. An examination of the types of this and *varius* shows them to be practically identical. *Dunnianus* is placed in accordance with the described characters, the species being unknown to me in nature.

A1. Rostrum continuous with the front.
  B1. Rostrum with sharply defined median sulcus.
    C1. Prothorax finely sparsely punctate.
      D1. Prevailing color of scales plumbeous, thorax and elytra vittate with white. 19 mm. Southwestern Texas. **speciosus** Lec.
      D2. Scales white, not or but feebly mottled. 12–15 mm. Phœnix, Arizona..... **nivosus** n. sp.
    C2. Prothorax more coarsely and closely punctate.
      Prothorax very coarsely punctate, scales white, conspicuously mottled with blackish plumbeous; all the tibiæ denticulate along the inner margin. 13–15 mm. Southern Arizona. **marmoratus** n. sp
      Prothorax moderately punctate; confusedly variegated above with pale and dark cinereous; tibiæ not denticulate. 6½–10 mm. Kansas to Arizona..... **sordidus** Lec.
  B2. Rostrum without median sulcus.
    E1. Scales light and dark gray, confusedly mottled; striæ fine, finely punctate. 7–11 mm. Western Texas to Arizona. **decipiens** Lec.
    E2. White, sometimes feebly unevenly mottled with gray; prothorax more transverse, elytral striæ very fine, scarcely punctate. 9½–11½ mm. El Paso, Texas.... **dunnianus** Csy.
A2. Rostrum separated from the front by a transverse impression.
  F1. Elytral striæ wide, and rather closely coarsely punctate, intervals convex.
    G1. Basal joint of antennal funicle neither wider nor longer than the second; scales cinereous and fuscous intermixed; prothorax with wide dorso-lateral fuscous stripes. 8 mm. Cape San Lucas..... **lucanus** Horn.

G2. Basal joint of antennal funicle much longer and somewhat wider than the second.

H1. Elytral setæ longer and more abundant than usual, pale brownish testaceous in color, scales uniformly cinereous throughout. 13–20 mm. Winslow, Arizona.
wickhami Sharp.

H2. Elytral setæ much sparser and shorter, silvery white in color.

I1. Prothorax coarsely punctate, widest anteriorly; scaly vestiture mottled, white and dark gray; elytral setæ very sparse and excessively minute. 12–15 mm. Western Arizona and Colorado Desert of California.....**argentatus** Lec.

I2. Prothorax finely punctate, widest at about the middle; scaly vestiture whitish, not or scarely mottled; elytral setæ moderately numerous. 17–22 mm. Colorado Desert, California.
desertus Horn.

F2. Elytral striæ fine, finely punctate, the intervals flat or nearly so.

J1. Prothorax very finely punctate, scaly vestiture white, prothorax with rather wide dorso-lateral blackish vittæ, elytra feebly irrorate with blackish gray; tibiæ denticulate within. 12–18 mm. Death Valley, Southern California.
mortivallis n. sp.

J2. Prothorax rather coarsely and deeply punctate.

K1. Median sulcus of beak narrow and sharply impressed; prothorax trivittate with dark gray, elytra conspicuously vittate; tibiæ finely denticulate. $7\frac{1}{2}$–$12\frac{1}{2}$ mm. Southern California.
gemmulatus Horn.

K2. Median sulcus of beak broader and more vague; neither prothorax nor elytra distinctly vittate; tibiæ not appreciably denticulate.

L1. Vertex evenly convex, scales whitish to cinereous, marmorate with darker gray; size smaller. 7–$11\frac{1}{2}$ mm. Arizona, California, Nevada.....**varius** Lec.

L2. Vertex flattened, finely carinate, scales pinkish-cinereous, feebly mottled with gray; size larger. 14 mm. Western border of Colorado Desert, California.....**aridus** n. sp.

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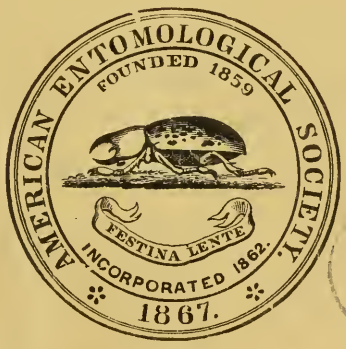

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SUBSCRIPTION PRICE FOUR DOLLARS PER VOLUME.

NEW AND LITTLE-KNOWN BEES.

BY T. D. A. COCKERELL.

The bees described and recorded in this paper are mostly in the British and Berlin Museums. In the British Museum last year I was allowed to mark among the enormous accumulations of unworked material the specimens which I desired to study, and these were later sent to me. In this way I was enabled to examine an unusually interesting series of specimens from different parts of the world. At the same time I obtained the loan of the splendid Turner collection of Australian bees, also in the British Museum, and so am able to make considerable additions to the known Australian fauna. I am greatly indebted to Mr. Geoffrey Meade-Waldo and Mr. Rowland E. Turner for their assistance and co-operation in all these matters.

In the descriptions of venation the following abbreviations are used: s. m. = submarginal cell; r. n. = recurrent nervure; t. c. = transverso-cubital nervure; b. n. = basal nervure; t. m. = transverso-medial nervure.

Paracolletes vigilans (Smith).

A specimen labelled "Nov. Holl. occ. Pr." (Berlin Museum, 2555) was found to exactly agree with Smith's account of *Leioproctus vigilans*, and also with my notes made from Smith's type, but apparently to differ in having a large bidentate process on the postscutellum. I asked Mr. R. E. Turner to look at Smith's material in the British Museum, and having done so, he reports the presence of the postscutellar process just as in the Berlin Museum example. It is strange that it was overlooked both by Smith and myself.

Paracolletes dentiger sp. nov.

♀. Length about 12 mm., rather slender, superficially looking just like *Andrena mimetica* Ckll. Deep purplish-blue, strongly punctured, the pubescence black and white; hair of head mostly white, but black on vertex, upper part of front, clypeus except lower corners, and scape; mandibles with an inner tooth; clypeus mostly greenish, with dense

very large punctures, and an imperfect smooth median band; sides of front dull and rugose; face on each side of clypeus covered with appressed white hair; flagellum obscurely brownish; fourth and fifth antennal joints very short, broader than long; mesothorax and scutellum densely punctured; postscutellum with a stout median spine or tooth, which emits a few long curled black hairs; pleura with large irregularly placed punctures; area of metathorax triangular, dullish, its upper part transversely striate; hair of thorax mostly white, black on scutellum and disc of mesothorax, also black just beneath wings; tubercles densely fringed with white hair, making them appear as white spots; tegulæ shining piceous; wings dusky, especially dark in upper part of marginal cell and on apical margin; b. n. meeting t. m., the latter oblique; first s. m. very long; second small, receiving first r. n. at its basal corner; second r. n. received about beginning of last third of third s. m.; legs reddish-black, obscurely submetallic, the hind ones distinctly metallic, their hair white, that on the inner side of hind basitarsus fuscous; abdomen with a fine sculpture, running into delicate transverse striæ, which have a wavy appearance; segments covered with a very fine white tomentum, shining in favorable lights; apex with black hair; venter with white hair; fifth ventral segment green.

By the armed postscutellum this is allied to *P. vigilans*, but it differs in color, venation, sculpture and the character of the postscutellar process.

Hab.—Australia; "Nov. Holl. occ. Pr." (Berlin Museum, 1952). Collected by Preiss.

Paracolletes plumosus (Smith).

Victoria (*C. F.*, Turner collection). On the right side the first r. n. enters middle of second s. m., but on the left it enters at the end of the first third. This variation increases the probability that *P. plumosellus* Ckll. is the male of *plumosus*, but nevertheless I believe it is distinct, as I have before me another male which must surely be veritable *plumosus*. This insect is like *plumosellus*, but larger (expanse $18\frac{1}{2}$ mm.), with the head and thorax a yellower green (essentially as in *plumosus*), the vertex and much of scutellum and hind part of mesothorax with dark fuscous hair, the anterior tibiæ bright red in front, and the other tibiæ and tarsi partly red. The tongue is colletiform. This male *plumosus* is from Melbourne, Victoria (Rolle; Berlin Museum).

Paracolletes bicolor (Smith), var. a.

A male from W. Australia (*Dr. J. Burton Cleland;* British Museum) is referred here as a variety, although the legs are not at all red, except slightly at apex of hind tibiæ, and on anterior tibia in front. The vertex and mesothorax also are strongly green. This agrees in size with *plumosellus*, but is easily separated by the abundant black hair on vertex, scutellum and hind part of mesothorax. The abdomen is narrower and duller than in *plumosus*, and dark purplish. The flagellum is quite strongly crenulate beneath. The three species, *plumosus*, *plumosellus* and *bicolor*, are closely related, but evidently distinct.

Paracolletes flavomaculatus Ckll.

This species was described from a male. A female from the Turner collection comes from Cairns, Queensland, "Kur., 9. 02." It is slightly over 10 mm. long, and agrees with the male except for the usual sexual differences. It agrees with Smith's description of *P. cristatus*, except that the hair of the face is reddish-black, not griseous, the wings are uniformily dilute fuscous, and the large scopa of the hind tibiæ is entirely dark fuscous. The hind spur of hind tibia has five long sharp teeth. Tongue colletiform as usual.

It is probable that this will prove to be a subspecies or variety of *P. cristatus*.

These bees curiously resemble the black species of *Prosopis* with yellow scutellum and postscutellum common in Australia. The yellow dorsal patch in the *Prosopis* is tegumentary, in the *Paracolletes* due to hair, but the superficial effect is the same. To my astonishment I find also an *Halictus* with the same coloration (the patch due to hair), so similar to *Paracolletes flavomaculatus* that I had no doubt of its being a close relative until I came to examine it in detail.

Halictus paracolletinus sp. nov.

♀. Length about 8 mm., black, the scutellum, postscutellum and tubercles covered with felt-like ochreous hair. This looks exactly like a small edition of *P. flavomaculatus*, but differs as follows: eyes more converging below; clypeus with sparser, much weaker punctures;

front very minutely rugosopunctate (with distinct strong punctures on a shining ground in *flavomaculatus*); flagellum ferruginous beneath at base; hair of front and vertex pale yellowish; mesothorax dullish, finely punctured all over, very densely at sides; mesopleura dull and densely rugosopunctate (shining, with sparse strong punctures in *flavomaculatus*); area of metathorax with fine longitudinal rugæ; lower section of basal nervure very strongly arched; first r. n. meeting second t. c.; hind tibiæ with a moderate, largely pale scopa (nothing like the broad strongly plumose scopa of *flavomaculatus*); abdomen less shining, minutely punctured all over.

Known from other Australian *Halicti* by the thoracic patch, the dusky wings, and the black abdomen without hair-bands or spots. The hind spur is finely serrate or denticulate, with numerous little teeth. The posterior truncation of metathorax is well defined, its lateral margins sharp.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 461). Three females.

Paracolletes fimbriatinus sp. nov.

♂. Length about 10 mm.; head and thorax black, covered with bright fox-red hair, that over clypeus dense and shining golden; abdomen rather small, bright ferruginous red, strongly punctured, with a rather marked constriction between first and second segments; face rather broad; mandibles bidentate, black with a reddish spot; tongue colletiform as usual; antennæ ordinary, third and fourth joints about equal, flagellum red beneath; mesothorax and scutellum shining, strongly punctured; area of metathorax triangular, with a strong transverse keel; tegulæ shining clear amber-color; wings clear, faintly dusky at apex; stigma ferruginous, fairly well developed; nervures ferruginous, the outer ones darker; marginal cell flattened, almost truncate, at end; b. n. meeting t. m.; first r. n. joining second s. m. before the middle; legs mainly red, with reddish hair, but femora blackish except apically, and middle and hind tibiæ with a large blackish cloud; hair of abdomen mostly pale reddish, but short fuscous hair on the more or less darkened hind margins of the segments; apex darkened; third to fifth ventrals with broad even fringes of yellowish hair.

Var. a.—Hair of head and thorax pale ochreous.

This species is very near to *P. fimbriatus*, which is known only in the female. The color of the tegulæ and the better developed stigma seem to indicate that *fimbriatinus* is not the male of *fimbriatus*.

Hab.—Victoria (*C. F.*; Turner collection). British Museum). Two males.

Paracolletes turneri sp. nov.

♀. Length about 11 mm.; brilliant blue and green, with the caudal fimbria bright orange-fulvous; head broad, strongly and closely punctured; clypeus and face green, the supraclypeal area and lower part of clypeus with brassy tints; vertex and cheeks mainly blue; hair of face white, dense at sides, of cheeks and occiput also white, but of vertex fuscous; a keel between antennæ; flagellum short, dull reddish beneath; tongue colletiform as usual; mesothorax and scutellum shining green, with strong well-separated punctures, sparse on middle of mesothorax; metathorax blue-green, the basal area smooth and shining; pleura fine dark blue; hair of thorax white, but dark fuscous on scutellum and middle of mesothorax (a broad band between the wings, only evident in lateral view); tegulæ rufo-fuscous; wings hyaline, a little dusky, stigma and nervures piceous; second s. m. broad, receiving first r. n. well before its middle; b. n. just falling short of t. m.; marginal cell narrowly truncate at apex; legs dark reddish with mostly pale hair; scopa on hind tibiæ dark fuscous on outer side, white on inner; hind basitarsus with a long posterior fringe of white hair; hind spur with eight long spine-like teeth; abdomen shining, finely and very distinctly punctured, the segments green basally and bluer beyond, the first two segments with the disc a splendid purple, beautifully contrasting with the green; hair of abdomen consisting of a short white tomentum, noticeable in lateral view, and thin interrupted yellowish-white hair-bands, hardly noticeable from above, on segments 2 to 4; fimbria brilliant fulvous; ventral segments with pale fringes.

Allied to *P. elegans* (Smith), but readily separated by the brilliant, contrasting and varied colors.

Hab.—Mackay, Queensland, Jan., 1891 (*Turner* 615). British Museum.

Paracolletes cupreus semipurpureus Ckll., var. a.

♀. Abdomen olive-green, strongly tinged with brassy.

Hab.—Mackay, Queensland, May, 1900 (*Turner* 863). British Museum.

Paracolletes providus (Smith), var. a.

Port Philip, Australia (*Coulon*). One of each sex; Berlin Museum. The female differs from Smith's description in having the vertex, posterior middle of mesothorax and middle of scutellum with fuscous hair, and the basal half of scopa on hind tibiæ fuscous above. The flagellum is very obscurely brownish beneath. Hind spur with numerous long spine-like teeth. This has the shining abdomen of *providus*,

but the pubescence is colored more as in *P. versicolor*. There can be little doubt, I think, that it is properly referred to *P. providus*, and even the apparent varictal differences may be due to the brevity of Smith's description. The male is evidently the insect referred to by me (Ann. Mag. Nat. Hist., Nov., 1905, p. 484) at the end of the description of *P. providellus*. The head and thorax are wholly without dark hair above. The hind margins of the abdominal segments are very distinctly reddened.

Paracolletes waterhousei Ckll.

♂. Victoria, Australia (*C. F.*, February, 1901; Turner collection). British Museum.

A species with much bright fulvous hair; apical plate of abdomen pointed.

Paracolletes argentifrons (Smith), var. a.

A male collected by Preiss in Western Australia (Berlin Museum, 2562), accords excellently with Smith's description and my notes on Smith's type, except that the second r. n. enters third s. m. some distance from its end, and the third and fourth ventral segments of abdomen have a fringe of fuscous hair. The abdomen is distinctly and finely punctured.

Paracolletes cæruleotinctus Ckll., var. a.

♂. Kuranda, Queensland (Turner collection). British Museum.

Agrees with type in nearly all respects, but hair of vertex black, apical margin of second abdominal segment with short black hair, abdomen brilliant purple-blue, slightly greenish toward the apex. This may represent a distinct local race.

Paracolletes nigroclypeatus sp. nov.

♀. Length 12 mm.; blue-green, the broad strongly punctured clypeus black, contrasting; mandibles dark; face very broad, with much white hair at sides; hair of vertex largely fuscous, of cheeks white; flagellum bright ferruginous beneath; mesothorax strongly punctured, the punctures running in subconfluent rows; middle of disc purplish, nearly impunctate; anterior part of mesothorax with some yellowish-green tints; area of metathorax with a transverse keel; hair of thorax dull white, with some fuscous on mesothorax, scutellum and anterior part of mesopleura; tegulæ reddish; wings brownish-hyaline, stigma and nervures reddish-brown; b. n. meeting t. m.;

marginal cell narrowly obliquely truncate; second s. m. broad, receiving first r. n. a little before middle; second r. n. joining third s. m. near end; legs dark rufopiceous; scopa of hind tibiæ fuscous seen from above, but beneath with very long curled white hair, strongly plumose at ends; abdomen broad, with varied bluish and green tints, very little punctured, the second segment nearly impunctate except for a row of scattered punctures just before the marginal area; no hair-bands; apex with dark fuscous hair; ventral segments fringed with long glittering white hair, only a little stained with fuscous on the fifth; apical plate rounded, not keeled; hind spur with five long spine-like teeth.

Closely related to *P. carinatus* Smith, but larger, with the clypeus black and the fringe on fourth ventral segment white.

Hab.—Victoria, Australia (*C. F.*; Turner collection). British Museum.

Paracolletes melbournensis sp. nov.

♀. Length about 11 mm.; olive-green, the clypeus and supraclypeal area strongly punctured, black, with crimson and golden tints at sides and in the vicinity of the suture between them; flagellum ferruginous beneath only at apex; hair of head and thorax ferruginous above, white below, but dark fuscous on vertex, middle of scutellum, and intermixed on disc of mesothorax; face very broad; mesothorax dullish, well punctured, a purplish-black nearly impunctate discal patch; area of metathorax transversely grooved, and with an evident though variable transverse keel; tegulæ shining piceous; wing hyaline, nervures and stigma rather dark reddish; b. n. meeting t. m.; first r. n. joining second s. m. in middle; second r. n. joining third s. m. almost at apex; legs black (not at all red); scopa of hind tibiæ black on upper outer side, otherwise white; hind basitarsus broadened; hind spur with long spines; abdomen entirely olive-green, with a dullish sericeous surface; apical fimbria black; ventral segments 2 to 4 with pure white fringes, fifth with a yellowish fringe.

Superficially just like *P. cupreus semipurpureus*, var. a, but considerably larger. From *cupreus* proper it is known by the black legs and pure green abdomen. It is also related to *P. amabilis*, but larger, and with the legs differently colored. All these insects form a group of closely related forms, and with the material at present available it is uncertain how many valid species are represented.

Hab.—Melbourne, Victoria (Rolle; Berlin Museum). Another specimen, in poor condition, is from Victoria (*C. F.*; Turner collection). British Museum.

Paracolletes mimulus sp. nov.

♀. Length about 10 mm.; almost exactly like *P. melbournensis*, but smaller and less robust, with the tibial scopa of hind legs white in front, yellowish behind, wholly pale except some fuscous hair surrounding the knee-plate; stigma and nervures clearer ferruginous, second submarginal cell smaller; flagellum ferruginous beneath except at extreme base; hair of vertex pale ochreous; hind basitarsi, and small joints of all tarsi, ferruginous; hair of thorax above ochreous or pale fulvous, without fuscous; abdomen with golden tints. The transverse keel on the blue-green area of metathorax is distinct.

This is another member of the group just referred to, very close to the others but apparently separable. No doubt these allied forms have different times of flights or visit different flowers.

Hab.—Victoria (*C. F.*; Turner collection). British Museum.

The species of *Paracolletes* discussed in this paper may be separated thus:

Postscutellum with a process ..... 1.
Postscutellum unarmed ..... 2.
1. Postscutellum process simple ..... **dentiger** Ckll.
Postscutellum process bidentate ..... **vigilans** (Sm.).
2. Abdomen red ..... **fimbriatinus** Ckll.
Abdomen black or dark brown, not metallic ..... 3.
Abdomen metallic, bluish or greenish, blue or green ..... 5.
3. Scutellum and postscutellum appearing yellow from a patch of dense hair ..... **flavomaculatus** Ckll.
Thorax not thus ornamented ..... 4.
4. Hair of head and thorax black and white. **argentifrons** (Sm.) var. a.
Hair of head and thorax bright fulvous red... **waterhousei** Ckll.
5. Apex of abdomen covered with bright fulvous hair... **turneri** Ckll.
Apex of abdomen without bright colored hair ..... 6.
6. Abdomen olive-green, sometimes with strong brassy tints ..... 7.
Abdomen bluish or purplish or blue-green, often dark ..... 9.
7. Scopa of hind tibia almost entirely pale; no dark hair on head or thorax above ..... **mimulus** Ckll.
Scopa of hind tibia with a dark fuscous band extending its whole length; vertex with dark fuscous hair ..... 8.
8. Larger, length about 11 mm ..... **melbournensis** Ckll.
Smaller, thorax above with less dark hair. **semipurpureus** (Ckll.) var. a.
9. Tegument of thorax black ..... **providus** (Sm.) var. a.
Tegument of thorax matallic green or bluish ..... 10.

10. Head and thorax above yellowish-green, with coppery tints, and much dark hair; abdomen blue.
cæruleotinctus Ckll. var. a.
Head and thorax above bluish-green or blue.....11.
11. Abdomen with strong green tints; flagellum bright ferruginous beneath; one of the larger species...**nigroclypeatus** Ckll.
Abdomen purple or blue; flagellum less brightly colored, or dark .....12.
12. Abdomen broader, shining steel blue .....**plumosus** (Sm.).
Abdomen narrower, duller, dark purple.....**bicolor** (Sm.) var. a.

Euryglossa victoriæ sp. nov.

♀. Length about 10 mm.; head and thorax black, the front bluish, the metathorax dark green; legs black with white hair, the knees whitish, small joints of tarsi ferruginous; abdomen broad and flattened, with a satiny lustre, olive-green, with the sides of the first three segments, and a cloud on the fourth, chestnut red, on the second segment the red is very extensive, leaving only the middle third green; venter of abdomen green, the margins of the segments whitish hyaline; hair of head and thorax rather dull white, but that on occiput abundant and strongly yellowish; clypeus flattened, with irregular large punctures; antennæ very dark brown, flagellum reddish beneath, especially toward the apex; front finely roughened; mesothorax pure black with strong but sparse punctures, more or less in rows; scutellum well punctured, its posterior margin vertical; area of metathorax shining; pleura rough and dull, greenish; hind spur strongly dentate; tegulæ light fulvous; wings clear, stigma and nervures ferruginous, venation normal; hair at apex of abdomen fuscous.

Close to *E. tricolor* Smith, but larger, and differing in the details of coloration.

Hab.—Victoria (*C. F.*). Turner collection. British Museum.

Euryglossa perditiformis sp. nov.

♀. Length about 5½ mm.; light lemon-yellow with dark markings; head broad, yellow; apical third of mandibles dark; antennal sockets depressed, black, united by a dark band curving over supraclypeal area, the dark color also extending as a rounded lobule on each side of the antenna, and also downwards as a short band, the shape of the dark area about the socket resembling a duck's head with the beak pointed downwards; occiput black, and a black band across the vertex, having a pair of triangular projections in front of the ocelli, and an extension part way down the orbits, so that the upper margin of the yellow is trilobed; front smooth and shining; antennæ brown above and yellow beneath; thorax yellow, with the sutures more or less black lined; mesothorax with three very broad longitudinal black bands,

much broader than the intervals between them, the lateral ones claviform; lower part of mesopleura with a large black patch; area of metathorax shining black, with an irregular (lobulate) central yellow spot, the black also continued as a broad band down below the area; tegulæ with a yellow spot in front, bordered by brown and posteriorly testaceous hyaline; wings hyaline, iridescent, nervures and stigma very pale yellowish; lower part of b. n. strongly arched, falling far short of t. m.; first r. n. meeting first t. c.; marginal cell sharply pointed; legs yellow; anterior femora broad and flattened, with a large black mark behind; anterior and middle tibiæ with a dark brown stripe behind; hind tibiæ black and hairy on posterior side; tarsi reddish, hind ones fuscous; abdomen with very broad entire dark brown bands on first four segments, and two large marks on fifth; venter yellow.

Related to *E. quadrimaculata* and *E. calliopsiformis*, but very distinct. It is curiously similar to some species of *Perdita*, especially *P. punctosignata*.

Hab.—Mackay, Queensland, Jan., 1897 (*Turner* 459). British Museum.

Euryglossa calliopsella sp. nov.

♀. Length about 6 mm.; close to *E. calliopsiformis* Ckll., but differing as follows: yellow markings rather pale; clypeus with only lateral (small) black marks; frontal mark subtriangular, broadly connected with supraclypeal; the broad lateral marks reaching as high as top of frontal, obliquely truncate, the longer side inner; sides of prothorax yellow with a narrow black stripe; sides of mesothorax anteriorly with yellow lateral bands, curving round in front and becoming continuous with the longitudinal (discal) yellow lines; lower part of pleura marked with yellow; anterior femora broad, yellow above and in front, middle femora yellow with the lower edge brown; abdomen with very broad yellow bands at bases of segments, that on fifth interrupted; first segment also with a yellow spot on each extreme side; venter fuscous. The hind spur is coarsely serrate.

The venation differs from that of *E. perditiformis*, in that the first r. n. joins the second s. m. a long distance from its base.

Hab.—Victoria (*C. F.*). Turner collection. Two in British Museum.

Euryglossa semipurpurea sp. nov.

♀. Length about 3½ mm.; head and thorax black (front and vertex a little brassy), abdomen dark reddish-purple; head broad, antennæ close together, the sockets depressed; front shining; upper part

of clypeus and a contiguous band on supraclypeal area light yellow; mandibles ferruginous except at apex; antennæ ferruginous beneath, scape thick; cheeks shining; mesothorax and scutellum dullish, metathorax shining, no yellow marks on thorax; tegulæ rufo-fuscous; wings quite clear, iridescent, stigma large; second s. m. small; second t. c. in a straight line with second r. n.; first r. n. joining first s. m. a short distance before apex; lower side of first s. m. straight; legs pale reddish, the femora and the tibiæ more or less infuscated; abdomen broad, shining, microscopically transversely lineolate; hind spur coarsely serrate.

This minute species may best be compared with *E. pernana* Ckll., from which it differs at once in the venation and the color of the abdomen. The venation is not normal for *Euryglossa*.

Hab.—Mackay, Queensland, at flowers of *Eucalyptus*, March, 1900 (*Turner*). British Museum.

Euryglossa jucunda Smith.

A female from Mackay, Queensland. Nov., 1893 (*Turner* 867), agrees with Smith's description, but is in poor condition, and has lost the apical half of the abdomen. It is related to *E. subsericea*, but easily separated by the narrower face and bright ferruginous under side of flagellum.

Euryglossa chrysoceras Ckll.

A male from Victoria (*C. F.*; Turner collection), in the British Museum agrees with the type, but has the dark parts of the abdomen black, with ferruginous (narrowly) between the black and the whitish hind margins of the segments.

Euryglossa myrtacearum sp. nov.

♀. Length about 6½ mm.; robust, broad, the abdomen cordate; head and thorax black, with dull whitish hair; head broad, front densely punctured, facial foveæ linear; mandibles obscure reddish about the middle; scape dark reddish in front; flagellum ferruginous beneath except at base; mesothorax shining, closely punctured at sides, but on disc sparsely though strongly punctured; scutellum with strong well separated punctures; area of metathorax smooth and shining, its lateral margins with a double curve; tegulæ shining fuscous; wings hyaline, nervures and stigma dull ferruginous; second s. m. large, broadened outwardly, receiving the recurrent nervures near apex and base; lower side of first s. m. curved; lower section of b. n. strongly arched, ending far from t. m.; femora and hind tibiæ very dark reddish brown, the knees ferruginous, the other tibiæ redder, the tarsi clear ferruginous; hind spur with large teeth; abdomen ferruginous with a sericeous (microscopically granular) surface; basal half

of first segment nearly black, and a pair of large dark lobes projecting into the red apical portion; apical segments entirely red.

This may be compared with *E. bicolor* Smith, but it lacks the dark stripes on the abdomen.

Hab.—Mackay, Queensland, at flowers of *Leptospermum*, Oct., 1898 (*Turner* 2a). British Museum.

Euryglossa salaris sp. nov.

♀. Length about 9 mm.; head and thorax black, agreeing in general with those of *E. myrtacearum*, but the punctures of the mesothorax large, with very minute ones between, and the puncturation not very dense anywhere; scutellum sculptured like the mesothorax; area of metathorax shining; face broad, front densely punctured; flagellum ferruginous beneath; tegulæ dark reddish; wings hyaline, nervures and stigma dark reddish-brown; venation as in *E. myrtacearum*, except that first r. n. enters second s. m. distinctly further from base than second from apex; legs black or brown-black, with pale hair, the small joints of tarsi ferruginous; hind spur coarsely serrate; abdomen ferruginous, not so broad in proportion to its length as in *E. myrtacearum;* apical margins of segments with short pale hair forming partial bands; first segment dusky, clouded with reddish, lateral hind margins pallid; second and third segments with a transverse dark discal streak; apical segments and venter light.

Var. a.—Abdomen blackish, slightly metallic, the last three segments red, and slight red shades on second and third, and about base of first.

The mesothoracic punctures are considerably larger in this species than in *E. subsericea*.

Hab.—Mackay, Queensland; type, Nov., 1893 (*Turner* 865), var. a, same date (*Turner* 866).

Euryglossa subfusa sp. nov.

♀. Length about 8½ mm.; head and thorax shining black, with scanty dull white hair; abdomen thick but parallel-sided, clear red, with the first segment and basal half of second bluish-black; clypeus smooth, its lower margin conspicuously fringed with pale hair; a delicate keel between antennæ; front with widely separated punctures; tongue prosopiform; flagellum clear ferruginous beneath; mesothorax and scutellum with fine scattered punctures; area of metathorax shining; tegulæ dark rufo-fuscous; wings hyaline, nervures and stigma fuscous, venation practically as in *E. salaris;* legs black with pale hair, tarsi ferruginous at end; abdomen dullish, sericeous, the red part slightly purplish in certain lights, the apical segments wholly red.

Hab.—Port Darwin, Australia, Dec., 1902 (*Turner*). British Museum.

Euryglossa pavonura sp. nov.

♀. Length about 10 mm.; head and thorax black, but the front greenish, the vertex bluish, and the metathorax distinctly metallic; clypeus shining, with sparse shallow punctures; front with strong well-separated punctures; the linear facial foveæ reaching downwards to level of antennæ; mandibles dark; middle of flagellum marked with yellowish beneath; mesothorax shining, with strong punctures, widely separated on disc; area of metathorax shining; tubercles densely fringed with white hair; pleura bluish; tegulæ piceous; wings hyaline, nervures fuscous, the outer ones pallid; stigma unusually small; venation normal, first r. n. entering second s. m. a considerable distance from base; legs black, with pale hair, hind spur dentate; abdomen above brilliant peacock-green, with varying shades, bluer and yellower; fifth segment fringed with fuscous hair; venter much darker.

A very distinct and beautiful species.

Hab.—Cooktown, Australia, April, 1902, two females (*Turner*). British Museum.

The following table will be useful for the separation of a number of species of *Euryglossa*.

Extremely small (about 3½ mm. long); face of female with a large light spot; lower side of first s. m. straight; first r. n. entering s. m.; second s. m. small (subgenus *Euryglossina* nov.).....**semipurpurea** Ckll.

Not thus minute; first r. n. not entering first s. m. .....1.

1. Mesothorax black, striped with yellow.....2.
   Mesothorax not striped.....3.
2. First r. n. joining first t. c. .....**perditiformis** Ckll.
   First r. n. joining second s. m. a considerable distance from base. **calliopsella** Ckll.
3. Mesothorax red.....4.
   Mesothorax dark.....6.
4. Abdomen dark.....**ephippiata** Smith.
   Abdomen red .....5.
5. Fifth abdominal segment black .....**leptospermi** Ckll.
   Fifth abdominal segment red .....**frenchii** Ckll.
6. Clypeus yellow; first r. n. meeting first t. c. **sinapipes** Ckll. (male).
   Clypeus dark .....7.
7. Males .....8.
   Females .....10.
8. Flagellum bright ferruginous; hind margins of abdominal segments broadly subhyaline .....**chrysoceras** Ckll.
   Flagellum dark, at most obscurely reddish beneath.....9.

9. Larger; head and mesothorax greenish ..... **subsericea** Ckll.
   Smaller; head and mesothorax black ..... **reginæ** Ckll.
10. Abdomen brilliant peacock-green; large species.
   pavonura Ckll.
   Abdomen not thus colored ..... 11.
11. Occiput conspicuously covered with yellowish-white hair, so that at a glance the upper border of the prothorax seems to be light yellow as in some *Prosopis;* abdomen green and red.
   victoriæ Ckll.
   Occiput not thus ornamented ..... 12.
12. Abdomen red (sometimes clouded with dark in *salaris*) ..... 13.
   Abdomen not red ..... 15.
13. Mesothorax very little punctured; base of abdomen dark purplish.
   subfusa Ckll.
   Mesothorax well punctured ..... 14.
14. Smaller; basitarsi clear red ..... **myrtacearum** Ckll.
   Larger; basitarsi not red ..... **salaris** Ckll.
15. Flagellum dark, at most slightly reddish beneath.
   subsericea Ckll.
   Flagellum bright ferruginous beneath ..... 16.
16. Large and robust; wings reddish; stigma and nervures ferruginous ..... **schomburgki** Ckll.
   Smaller, face rather narrow; stigma dark ..... **jucunda** Smith.

Megachile sculpturalis Smith.

A female from Chusan Island (*Walker*), in the British Museum, appears to represent a slight variety of this species, having the apical part of the ventral scopa nearly a pure black. I believe that *M. montonii* Gribodo is a synonym of this species; it is at least extremely closely allied.

The following table will be useful for the separation of female *Megachile* from China, Corea and Mongolia, but the recorded species must represent only a small fraction of those existing:

Ventral scopa white; legs red ..... **chinensis** Rad.
Ventral scopa red or fulvous ..... 1.
Ventral scopa dark brown, with black hairs; mandibles not dentate.
   koreensis Rad.
Ventral scopa black; length 26–27 mm. ..... 2.
Ventral scopa bicolored ..... 3.
1. First three abdominal segments dusky ocher-yellow haired; length 12 mm. ..... **mongolica** Mor.
   Metathorax and first abdominal segment white-haired; length 16 mm. ..... **relata** Smith.

2. Abdomen with hair all black beyond first segment.
monticola Smith.
Abdomen with white apical hair-bands on segments 2 to 5.
rhinoceros Mocs.
3. Sides of face with pale hair; abdomen with metallic tints.
remota Smith.
Hair of face all black .....4.
4. Smaller; sides of thorax with light hair .....**humilis** Smith.
Larger, 19–21 mm.; thorax with fulvous hair above.
sculpturalis Smith.

M. monticola and *rhinoceros* have a process on the clypeus, and are related to *M. tuberculata*. *M. sculpturalis* has the abdomen slightly metallic.

Gronoceras catulus sp. nov.

♂. Length about 15 mm., gray, like a small *G. felina* (Gerst.); in all respects nearly as in *felina*, but very much smaller, with the hair of the abdomen, between the bands, pale like the bands, though less dense (some long black hairs intermixed just before the bands), so that the abdomen appears much less distinctly banded than in *felina*. Friese describes two smaller species allied to *G. felina*, namely *laminata* and *armatipes*; *laminata* male differs at once from *catulus* by the simple legs and the color of the thoracic hair; *armatipes* male has red mandibles, and the abdomen seems to be different.

Hair of face arranged and colored as in *felina*, yellowish-white with some dark hairs intermixed; mandibles black, formed as in *felina*, with the same large lobe beneath, but somewhat elbowed about the middle; blade of maxilla striate as in *felina*; antennæ black, third joint shorter than fourth, apical part of flagellum grooved beneath; hair of head and thorax above white mixed with black, the black less abundant than in *felina*, the whole effect paler; wings clear, a little dusky at apex; as in *felina*, the b. n. falls short of t. m.; legs formed and colored (including hair) as in *felina*; anterior coxæ with two spines, one long and one short; anterior tarsi flattened, yellowish, the basitarsus with a dusky spot as seen from above, but from beneath it is intense black on a white ground, ocellus-like; lateral hair-fringe largely blackened; middle tibiæ with long white hair behind; middle tarsi with a great fringe of dark fuscous hair, spreading on either side; hind tibiæ with dark fuscous hair behind; claws bifid; apex of abdomen, as in *felina*, with long white hair, and a longer black brush, and the usual pair of long stout spines.

Hab.—"Maziwa Mitatu and Maungu, March 14 and April 4, 1897," British East Africa (*C. S. Betton*). British Museum.

Anthidium chubuti sp. nov.

♀. Length about 13 mm., anterior wing 9, width of abdomen a little over 5 mm.; black, with the antennæ, tegulæ, apices of femora (greater part of upper side of anterior ones), tibiæ and tarsi all bright red, these red parts with red hair, and also a tuft of red hair below anterior end of tegulæ; pubescence otherwise black, except on vertex, mesothorax and scutellum, where it is pale tawny (some black along hind margin of the rather projecting scutellum); the long red hair of scape contrasts curiously with the black of face; mandibles black with a red subapical spot, apical tooth large, inner teeth smaller and alike, five in number; no light face-markings, but vertex behind the ocelli with a cream-colored band, broad in the middle, tapering at either end; thorax without light markings; mesothorax and scutellum densely punctured; anterior wings with the basal half orange, with orange nervures, the apical half yellowish dusky, the outer nervures dark fuscous; second r. n. meeting second t. c.; no pulvillus; end of abdomen with a sharp tooth on each side; first five segments each with a pair of cream-colored marks, those on the first two elongated, and quite lateral, the others becoming shorter and rounded and closer together, the last pair separated by an interval less than the diameter of either; ventral scopa black.

Hab.—V. del Lago Blanco (misprinted Xanco on label), Patagonia (*Chubut*). British Museum. Closely related to *A. steloides* Spinola, from Santiago, Chile, but considerably larger and more robust, and differing in details of coloration. Another close ally is *A. rubripes* Friese, from the Argentine, but this is narrower and otherwise different. Brethes (1909) has transferred *A. rubripes* to *Dianthidium*, but from the description it is evidently near *A. steloides* and *chubuti*, and Jörgensen gives an account of the nest, which shows that it cannot be a *Dianthidium*.

Anthidium flavipes Morawitz.

This species was described from Central Asia. A male in the British Museum is from Perim Island, in the Straits of Bab-el-Mandeb. I have never seen authentic *A. flavipes*, but the Perim Island specimen agrees so closely with the description that it is impossible to separate it. It differs in being a little larger, fully 9 mm. long. The second r. n. goes well beyond the apex of second submarginal cell, and from

its evident affinities the insect ought to be a *Dianthidium*, but the feet are without pulvilli. The hind trochanters are strongly toothed, the axillæ are feebly toothed, and the apex of the abdomen resembles that of *A. latreillei*. The abdomen is yellow with light red bands along the hind margins of the segments. The eyes are light reddish.

Dianthidium (Anthidiellum) truncatiforme sp. nov.

♂. Length about 5½ mm.; very short and compact; clypeus, lateral face-marks (extending nearly to lower level of antennal sockets), and mandibles except teeth, brownish-white, the color nearly as in *D. strigatum;* thorax all black; edge of head above with a linear yellow band widely interrupted in the middle; tegulæ shining black with a yellow spot; wings strongly infuscated; second s. m. much longer than first, reciving first r. n. near base, the second r. n. going beyond its apex; anterior and middle femora with a yellow stripe beneath; tibiæ all yellow on outer side, and largely on inner; middle basitarsus with a yellowish stripe; hind basitarsus bulging near base; ends of tarsi becoming ferruginous; hind tarsi with hair white on outer side and orange on inner; abdomen with large bright yellow marks on all the segments, becoming closer on each segment after the first, just as in *D. truncatum;* fifth segment yellow with a median dark line, sixth yellow: apex with two small hyaline teeth, widely separated. Mandibles tridentate; antennæ dark; scutellum projecting, with a very broad sharp edge, the lateral corners of which are triangular.

Very close to *B. truncatum* Smith, but the face-markings are differently colored (yellow in *truncatum*) and the lateral marks are longer (not reaching level of top of clypeus in *truncatum*). The clypeus is much higher than in *D. strigatum*.

Hab. — Tamsoo, Gold Coast, Africa. (British Museum, 1900–123.) I have only seen the female of *D. truncatum*, but Friese describes the male, and cites no difference in the face-markings; he states that abdominal segments 6 and 7 are black.

Habropoda festiva Dours.

Basutoland, Africa (*R. Crawshay*). British Museum.

Habropoda bettoni sp. nov.

♂. Length 16 mm. or rather over; general aspect of *H. festiva*, but abdomen even a little narrower (about 5 mm. broad), with much narrower hair-bands; hair of head, thorax and first abdominal segment fulvous, as in *H. festiva;* head, with large eyes, as in *festiva;* ocelli

in a very deep triangle; third antennal joint longer and more slender than in *festiva;* scape mainly cream-colored beneath; clypeus, labrum and mandibles pale yellow, marked as in *festiva*, except that in the middle of the clypeus is a very large semicircular black mark; hair at apex of labrum pure white (partly orange in *festiva*), and basal spots of labrum evanescent; thorax considerably smaller than in *festiva;* tegulæ dark rufo-fuscous; wings as in *festiva*, but uniformly suffused with reddish-dusky, and the first s. m. shorter, distinctly shorter below than the second; hair of legs creamy-white; anterior basitarsus with an immense tuft behind, which when seen from beneath is white and concave basally, followed by a black band, while the long outer hairs are black and fawn-color; anterior femora ferruginous, flattened and twisted, with very long hairs behind, and a curious specialized patch of hair, occupying a lanceolate depression, anteriorly on the apical half; middle femora deformed, with a great tuft of hair beneath; middle tibiæ with an obtuse red (black-edged) apical tooth; middle basitarsus flattened, broadened to the apex, with a very obtuse anterior tooth; hair on inner side of middle tarsus black at base, red beyond; hind femora very thick, flat and nude beneath; hind tibiæ thick, with a triangular red apical tooth; hair on upper side of middle and tibiæ creamy-white; hind basitarsus triangular, broad apically, flattened, shining, dark reddish, the posterior apical corner briefly dentiform (no strong tooth such as occurs in *festiva*); hair on inner side of hind basitarsus thick, appressed, rich dark red; last joint of hind tarsi long; basal segment of abdomen with brilliant orange-fulvous hair; the bands on remaining segments narrow, that on second pale fulvous, on third paler, on the others practically white; sides of sixth segment with long black hairs overlapping the white; apex with black hair; subapical ventral hair seal-brown and white.

Hab.—British East Africa (*C. S. Betton*). British Museum. A very ditinct and remarkable species, allied to *H. festiva* and *H. determinata* (*Anthophora determinata* Friese). The marginal cell in these insects is longer than in typical *Habropoda.*

Morgania appletoni sp. nov.

♀. Length a little over 5 mm.; head and thorax shining black, with minute, well separated punctures; labrum a little longer than broad, dark reddish; mandibles ferruginous, simple; malar space absent; eyes very pale reddish, very broad below; face with short silvery-white hair. scape ferruginous, flagellum dark, except at base; præflagellar joint well differentiated, oval; ocelli as in *Pasites maculatus;* sides of thorax, and metathorax except the smooth and shining middle, with much white hair; tubercles, and a spot on each extreme side of metathorax, ferruginous; scutellum moderately prominent, hardly bigib-

bous, smooth with scattered strong punctures; legs ferruginous, including coxæ, with short white hair; spurs ferruginous; tegulæ large, shining rufo-fulvous; wings slightly dusky, darker apically, stigma and nervures piceous; b. n. going a little basad of t. m.; marginal cell obliquely truncate, appendiculate; both recurrent nervures entering second s. m., the second as far from first as the first from base of second s. m.; abdomen shining clear ferruginous, the first two segments with a purple iridescence; white hair-patches at sides of second segment and a little white hair on segments beyond; apical plate very broad.

Easily known from *M. dichroa* by the small size, clearer wings, etc.

Hab.—Bohotle, Somaliland, Africa (*Vety. Major A. F. Appleton*). British Museum. The *M. dichroa* mentioned above is Smith's species, but it seems that there is an earlier *M. dichroa* (Spinola), of which *carnifex* Gerst., is a synonym; consequently Schulz renamed Smith's insect, which, accepting the priority of *Morgania*, must stand as *Morgania gerstackeri* (Schulz).

Pasites friesei n. n.

Pasites ater Friese, Kilimandjaro-Exped viii (1908), p. 148, (not *P. atra* Latr.).

Crocisa guineensis Rad.

Sierra Leone, W. Africa, Nov., 1904 (*Major F. Smith*). British Museum.

Crocisa prætexta Vachal.

Lagos, W. Africa (*H. Strachan*). British Museum.

The above two species of *Crocisa* agree with the too brief descriptions of the species to which they are attributed. They are very much alike, and also very like *C. picta*, but evidently distinct. The following characters (based on females) may be added to those previously published.

C. guineensis.—Hind wings evidently infuscated apically; abdominal markings turquoise-blue; hind margin of prothorax with an interrupted band of light blue hair, the adjacent parts of mesothorax black haired.

C. prætexta.—Hind wings scarcely infuscated apically; abdominal markings very pale blue; the two large bluish-white marks of thorax anteriorly partly on prothorax and partly on mesothorax.

Crocisa grahami sp. nov.

♀. Length 9½ mm.; scutellum W-like, all black, but white hair projecting from beneath the emargination; markings pale blue; wings very dark, violaceous with hyaline spots; face with bluish-white hair, the lower part of clypeus bare; lower half of pleura abruptly bare; more than the basal half of hind tibia light haired. The light markings on the thorax are of the usual pattern, with a broken band in front, a short anterior median longitudinal band (separated from anterior margin), a spot on each side of the last, a pair of lateral longitudinal bands, which are short and do not connect with the two large spots just anterior to the scutellum. The abdominal markings consist of broadly interrupted (squarely cut off) bands, and on the first segment a large lateral mark on each side, broadly emarginate or excavated within, its lower lobe representing the bands on the other segments.

Related to *C. lanosa* Friese, but not long-pilose. The abdominal markings are as in the much larger *C. guineensis*.

Hab. — Obuasi, Ashanti, Africa (*Graham*). Cambridge University Museum.

Ceratina (Ceratinidia) ridleyi sp. nov.

Length about 10 mm., black with light yellow markings; wings reddish dusky.

♂. Head and thorax shining, antennæ inserted in a wide basin, which is bounded by a strong ridge below and at sides, the lateral ridges contiguous with the eyes; face below antennæ yellow, except a black stripe down each side of the square upper half of the clypeus, and narrowly along the upper edge of clypeus, and the supraclypeal area black except a broad transversely oblong mark just above the clypeus; labrum yellow with two dark spots, and strong sparse punctures; mandibles yellow with the tridentate apex black; cheeks yellow; antennal basin divided in the middle by a longitudinal keel; a pair of yellow spots, almost touching, below the anterior ocellus; a pair of elongate yellow marks on upper side of head; antennæ piceous, scape yellow in front, flagellum thick, last joint somewhat pointed; mesothorax with the anterior half roughened and punctate, the posterior smooth and shining; the yellow markings of thorax consist of four stripes (the middle ones narrow) on mesothorax, prothorax above, and descending stripes, most of tubercles, mesopleura except posterior margin (broader above), scutellum, axillæ, band on postscutellum, and base of metathorax very broadly; femora, tibiæ and tarsi yellow, but the middle femora suffused with blackish, and the hind ones with rather more dark than light; inner side of hind tarsi with pale golden hair; tegulæ shining rufotestaceous; wings hairy, nervures and stigma dark reddish; abdomen shining basally, rugose apically, second and third segments distinctly but spasely punctured; first segment with

two yellow spots on disc, and a yellow apical band, interrupted in the middle and enlarged on each side; second segment with a yellow apical band narrowed and evanescent medially, but enlarged to broad triangles at sides, the enlargement being, however, nearly all on the base of the third segment, and so not really part of the band; third to fifth segments with basal bands enlarged at sides and failing in the middle; apical dorsal segments with fuscous hair, but venter with pale hair; apex truncate, the truncation tridentate or trituberculate, *i. e.*, with angular corners and a median tubercle; venter mainly yellow toward the base.

♀. Similar, but antennal basin less evidently bounded; upward extension of lateral face-marks better developed, going broadly up sides of front nearly to top of eyes, and enlarged opposite supraclypeal area; supraclypeal mark smaller; scape merely reddish; broadly triangular area of metathorax black, the rest yellow; middle and hind femora and hind tibiæ dark, but the knees light; anterior femora largely brown; light parts of legs a sort of yellowish-testaceous; first abdominal segment yellowish with a broad suffused brown band; second segment with broad basal and apical pale bands; fifth with an apical band; sixth light spotted; sides of third showing a basal band; lower part of mesopleura dark.

Hab. Singapore (*H. N. Ridley*). British Museum. In Bingham's table (Fauna of British India, Hymenoptera, vol. 1, p. 500) this runs to *C. moderata* as nearly as anything, but that is only half the size. It is, of course, related to *C. hieroglyphica* Smith, but is easily distinguished by the large hairy wings, the great development of yellow on the face, the large amount of yellow on the pleura, etc. By the yellow mandibles it is related to *C. flavipes* Smith, from China, but that is a much smaller species. It is also related to *C. flavopicta* Smith, from Sarawak; perhaps nearer to *flavopicta* than to any other, but that has the basal and apical segments of the abdomen, and the apical margins of the others, yellow.

Ceratina samburuensis sp. nov.

♀. Length about or almost 10 mm.; steel-blue and green, very strongly punctured; face below antennæ olive-green, with a very large yellow hat-shaped clypeal mark, the crown of the hat broadest at the top, cut off squarely, its breadth greater than the distance from either corner to the eye, the basal lateral process thick and obtuse; labrum and mandibles black, the latter strongly curved, bidentate at apex; vertex blue, shading into the green of the cheeks; scape and base of flagellum chestnut-red; thorax blue above, greener at sides; tubercles

yellow; middle of mesothorax with smaller punctures than lateral fields; base of metathorax dullish, except a narrow basal band crossed by ridges, tegulæ small, ferruginous; wings dusky, nervures and stigma (which is narrow) ferruginous; legs largely dark chestnut-red; the anterior knees, spot near apex of anterior femora behind, basal streak on their tibia, large basal mark on hind tibiæ, and most of hind basitarsus yellow; hind legs with much silver-white hair; abdomen green, constricted laterally at the sutures; sides of apical segment minutely denticulate; ventral hair white, except a minute tuft of yellow at extreme apex.

Related to *C. nasalis* Friese, but easily separated by the face-markings and the sculpture of the mesothorax. The eyes, in the dry state, are light ferruginous, those of *nasalis* are black.

Hab.—Samburu, British E. Africa, Oct. 30 to Nov. 20, 1896 (*C. S. Betton*). British Museum.

Nomia crawshayi sp. nov.

♀. Length 14 mm., expanse about 28; black, densely rugosopunctate; head and thorax with rather short dull grayish hair, tinged with ochreous dorsally, with black bristles intermixed on scutellum and posterior half of mesothorax; mandibles black, with a faint reddish spot about the middle; labial palpi with first joint about as long as the following three united; flagellum, especially the apical half, dark ferruginous beneath; third antennal joint a little shorter than fourth; tegulæ moderate, rufotestaceous; wings yellowish, the apical margins broadly and conspicuously infuscated; b. n. meeting t. m.; second s. m. square, receiving first r. n. a little beyond the middle; third s. m. longer than first; legs black with light yellowish hair; middle femora with a large ferruginous patch in front; hind femora red, clouded with black apically; hind tibiæ red; hair on inner side of hind basitarsus largely black or nearly so, but partly red; spurs red; abdomen with broad bands of appressed felt-like hair on hind margins of segments 1 to 4, the first narrower and paler, the other three very broad and bright warm yellowish-ferruginous; basal parts of the segments densely punctured and minutely tuberculate; fifth segment and apex with black hair, but red at sides of fifth; apical plate very narrow; hind margins of ventral segments with the tegument ferruginous.

Apparently reltaed to *N. theryi* Gribodo, of which only the male is known, but differing in the color of the tegulæ and other details.

Hab.—Basutoland, Africa (*R. Crawshay*). British Museum.

Judging from the description, it seems rather probable that *N. flavofasciata* Friese, is the same as *N. binghami* Ckll. If so, the latter has about a month priority.

Nomia basutorum sp. nov.

♀. Length 10½ mm., expanse 20; black, head and thorax densely rugosopunctate, with scanty short gray hair; face very broad, eyes converging below; tongue slender, not very long; mandibles red in middle; lower edge of clypeus with orange bristles; antennæ entirely black, scape long, *flagellum thick and very short;* hind ocelli much closer together than either is to eye; front and vertex much more coarsely sculptured than mesothorax; area of metathorax with a strong transverse ridge, bounding a shining channel which has feeble transverse raised lines; tegulæ moderate, ferruginous with the margin pallid; wings strongly infuscated, very dark, the broad apical margin a little darker; b. n. meeting t. m.; first r. n. joining second s. m. almost at its end, or about the beginning of its last fourth; third s. m. rather shorter than first; legs black and red, with golden hair; the red parts are the knees, the greater part of the anterior tibiæ, the middle tibiæ at base and apex, the hind tibiæ, and all the tarsi, but the hind basitarsus with a large subquadrate fuscous patch on outer side; hind basitarsus broad; spurs clear red; abdomen finely punctured, the hind margins of the segments brownish; second and third segments with white marginal hair-bands at sides only, but fourth with an entire narrow band; fifth with a broad fringe of light golden-reddish hair; venter with reddish hair.

An ordinary looking species, but easily recognized by the short thick flagellum, the dark wings and the venation. There is a rather strong general resemblance to *N. wellmani* Ckll., but that species has quite different abdominal hair-bands, a more coarsely sculptured mesothorax, etc.

Hab.—Basutoland, Africa (*R. Crawshay*). British Museum.

Nomia nana Sm. (*ruficornis* Sm.).

A male labelled N. W. Australia (*C. F.;* Turner collection), does not differ from one collected at Adelaide. This is a suprising extension of range.

Nomia australica regis subsp. nov.

♂. Agrees with *N. australica*, except as follows: scape and flagellum both dark, each with a very obscure reddish spot beneath at base; hair of face, occiput and cheeks white; wings clearer, hardly at all dusky; abdomen narrower basally, dark purple-blue, not greenish, the hair-bands white, only slightly tinged with yellowish.

Hab.—N. W. Australia (*C. F.;* Turner collection). British Museum.

Nomia tomentifera (Friese).

♂. Cairns, Queensland, "Kur. 2. 02" (*Turner*); female, Cooktown, Oct., 1902 (*Turner*). British Museum. Superficially much like *N. semiaurea* Ckll., but easily known by the dentate postscutellum (metanotum, Friese has it), and the mesothorax in both sexes with a large bilobed dark area, surrounded by short dense ochreous tomentum. The hind legs of the male are simple. Friese describes this as a variety of *N. cincta* Sm., but Smith mentions no postscutellar tooth in *cincta*, which is from Key Island. The tongue in *tomentifera* is linear and quite long, entirely different from the broad dagger-shaped organ of *N. australica regis*.

Nomia kurandina sp. nov.

♂. Length about 9 mm., expanse about 16; shining black, with black and white hair, the wings hyaline, faintly dusky, with the apex of the anterior pair dark fuscous, forming a very conspicuous subtriangular spot, by which the species is easily recognized; face covered with white hair, narrow, eyes converging below; vertex with black hair; lower margin of clypeus broadly dull white, the actual edge narrowly ferruginous; tongue rather long, linear; antennæ long, simple, entirely dark; mesothorax well punctured, shining, with short inconspicuous mostly black hair; scutellum strongly bigibbous, with much black hair; postscutellum unarmed, with dense white hair; base of metathorax with a very sharply defined transverse channel, which is shining and crossed by little ridges; tegulæ rather large, piceous with an obscure pallid spot; lower section of b. n. strongly arched, falling short of t. m.; second s. m. very small, receiving first r. n. very near its end; legs black, with white hair, black bristles at apices of hind tarsal joints; hind femora thick, excavated, transversely flattened and shining beneath; hind tibiæ broadened, subtriangular, produced at apex, flattened on inner side; abdomen shining with fine punctures of two sizes; first and second segments with thin white hair-bands at sides, third with a very broad entire band, apical segments with much coarse black hair; fourth ventral with a median raised line.

Related to *N. gilberti* Ckll., but easily separated by the apical wing-spots.

Hab.—Cairns, Queensland, "Kur., 11. 01" (*Turner*).

Nomia pseudoceratina sp. nov.

♂. Length about 8½ mm.; black, slender, with a shining, clavate abdomen, the hind margins of the segments testaceous, and covered

with pale ochreous hair-bands; head a little broader than long; mandibles largely dark reddish; face covered with ochreous hair; tongue short, broad basally, rapidly narrowing to the finely linear apical part; flagellum dull ferruginous beneath; mesothorax and scutellum strongly and closely punctured; hair of thorax above short, pale ochreous, dense on postscutellum and upper border of prothorax; hair of pleura shining yellowish; area of metathorax ill-defined, plicatulate; tegulæ small, shining dark rufous; wings dusky yellowish; b. n. meeting t. m., its lower section only faintly arched (not at all as in *Halictus*); second s. m. rather large, receiving first r. n. a little beyond middle; stigma large, dark reddish; legs very dark reddish, the tarsi ferruginous; hind legs slender, not deformed, the tibiæ somewhat produced at apex in front, the projecting angle ferruginous; first abdominal segment much longer than broad, distinctly punctured; on the other segments the sculpture becomes more indefinite; disc of fourth ventral covered with ochreous tomentum.

Not a typical *Nomia*; it belongs to a Malayan group, and is almost identical with *N. ceratina* (Sm.) from Sarawak; *N. clavata* Sm. from Gilolo is also allied. Perhaps all these insects are geographical forms of a single species.

Hab.—Mackay, Queensland, Jan., 1901 (*Turner*). British Museum.

Nomia hypodonta Ckll., var. a.

Male flagellum dull reddish beneath. Mackay; Queensland, March, 1900 (*Turner* 697). The basal nervure is strongly arched, *Halictus*-like, but the insect is a *Nomia*.

Nomia stalkeri sp. nov.

♂. Length about 10 mm.; black, head and thorax with abundant pale hair, white below, faintly yellowish dorsally; head broad; face densely covered with creamy-white hair; mandibles with the apical half ferruginous; tongue of the long and linear type; vertex dullish, very finely punctured; antennæ short for a male, the flagellum less than 3 mm., ferruginous beneath; mesothorax hairy, but not so as to hide the closely punctured surface; metathorax with the usual area consisting of a transverse band, obtusely angled in the middle, weakly cross-striate; tegulæ moderate, dark at base, otherwise pallid; wings strongly dusky, stigma dark ferruginous, nervures fuscous; lower section of b. n. well arched, meeting t. m.; second s. m. small, receiving first r. n. beyond the middle; legs black, with light hair; anterior tibiæ in front, and ends of claw-joints, ferruginous; hind tibiæ very hairy; hind legs not deformed; spurs clear ferruginous; abdomen

shining, minutely punctured, but punctures of first two segments much larger than those on third; hind margins of second and following segments (successively broader) whitish-hyaline, with long glittering hairs not constituting definite bands; venter with much white hair.

Very close to *N. tenuihirta* and *N. gilberti*, but known by the darker wings, red spurs, etc.

Hab.—Alexandria, Australia, April, 1906 (*W. Stalker*). British Museum.

Nomia melanoptera sp. nov.

♀. Length nearly 10 mm.; black, rather robust, with white and black hair; face covered with grayish-white hair; eyes strongly converging below; a more or less evident raised line from supraclypeal area down middle of clypeus; lower margin of clypeus with some fuscous hairs; tongue of the long and linear type; vertex dull and granular; antennæ wholly dark; mesothorax shining, not hidden by hair, with strong punctures of two sizes; scutellum somewhat bigibbous; mesothorax and scutellum with scattered black bristles, evident in lateral view; postscutellum with a band of pure white tomentum; metathoracic channel shining, the transverse wrinkles few and irregular, below the channel the lower part of the enclosure appears as a triangular smooth and shining space; tegulæ rather large, piceous; wings fuscous, unusually dark, though subtranslucent, the apex darker; basal section of b. n. very strongly arched, falling short of t. m.; second s. m. very small and narrow, receiving the first r. n. at its apical corner; legs black, with white hair on femora, and much coarse black hair on tibiæ and tarsi, outer side of tibial scopa pure white; a pencil of orange hair at end of hind basitarsus; spurs dark; abdomen shining, with very fine indistinct punctures; complete white hair-bands on segments 3 and 4, a thin band on 2, and a little patch on each side of first segment; margins of segments not at all discolored.

Very similar to *N. stalkeri*, *gilberti* etc., but distinguished by the very dark wings, dark spurs, feebly sculptured abdomen, etc.

Hab.—Cairns, Queensland, "Kur., 1. 02" (*Turner*). British Museum.

Nomia muscosa sp. nov.

♀. Length about 10 mm., black; superficially just like *N. melanoptera*, but easily separated by the following characters: mesothorax covered with a grayish moss-like tomentum, which appears black-speckled from the origin of many bristle-like black hairs; area of metathorax quite different, the apical triangle dull, and not cut off from the very narrow finely cross-ridged basal band; tegulæ reddish;

wings not nearly so dark; b. n. less strongly arched below, almost reaching t. m.; second s. m. larger, receiving r. n. not so near end; outer side of anterior tibiæ with pale hair; first abdominal segment with well defined punctures, as also the second, third with punctures of two sizes; scattered glittering white hair, but no well-defined bands; apex with dark fuscous hair. The spurs are black.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 698).

Nomia flavoviridis Ckll.

Five males from Cooktown, Australia, October, 1902 (*Turner*). British Museum.

Two females from Mackay, Queensland, at flowers of *Cassia*; Dec., 1899 (*Turner*). Also two females distinctly larger than the Mackay insect, one olive-green, including the abdomen, from N. W. Australia (*C. F.*; Turner collection), the other blue-green, from New South Wales (*C. F.*; Turner collection). These larger specimens also have the wings rather darker, and seem to constitute a distinct race. The tongue of *flavoviridis* is dagger-shaped.

I cannot avoid a suspicion that the "C. F." specimens from "N. W. Australia" are wrongly labelled. They seem, at least in the main, to represent a S. E. Australina fauna.

Halictus albofasciatus Smith.

This species was described only from the female; I have examined Smith's type and have before me a male, presumably conspecific, from Basutoland (*R. Crawshay*); British Museum.

♀.—A rather large species, with four broad ivory-white apical bands on abdomen; hair of thorax above ochreous; hind spur minutely nodulose.

♂.—Length about 10½ mm.; hair pallid throughout, only faintly tinged with yellowish dorsally; abdomen with five white tegumentary bands; segments beyond the third with a good deal of brownish-black hair, antennal joints 4 to 10 having beneath successively smaller shining patches, the outline of the affected part beneath crenulated.

All of Smith's 1879 *Halicti*, as well as numerous other species of African bees, are omitted from Friese's recent great work, "Die Bienen Afrikas."

Halictus galpinsiæ Ckll.

Utah Junction, Colorado, at flowers of *Anogra*, May 26, between 7 and 8 a.m. (*Cockerell*).

Halictus rowlandi sp. nov.

♀. Length a scant 5 mm.; head black, with the clypeus (except its upper border), labrum and middle of mandibles ferruginous; front moderately shining, but sides of vertex brilliant; hair of head and thorax white, very scanty and short; scape long, curved, light ferruginous beneath, flagellum very obscurely reddish beneath; tongue short dagger-shaped; *thorax and legs entirely light rufofulvous;* area of metathorax ill-defined, plicatulate at base; mesothorax microscopically tessellate, with scattered very weak punctures; hind spur simple (microscopically ciliate); tegulæ pale testaceous; wings hyaline, faintly dusky, iridescent, the very large stigma and the nervures dark brown; b. n. falling a considerable distance short of t. m.; outer nervures weakened; first r. n. entering apical corner of second s. m., the exact position variable; third s. m. very small and narrow, smaller than second; abdomen broad, shining light rufofulvous or rufotestaceous, hind margins of the segments narrowly infuscated, and a slight general dusky suffusion on the apical half; apical segment dark, the rima reddish.

A very distinct little species, totally different from all others by its peculiar coloration, which recalls that of the wasp, *Pison melanocephalum* Turner, also found at Cairns.

Hab.—Cairns, Queensland, "Kur. 2. 02," two ♀s (*Rowland E. Turner*). British Museum.

Halictus eyrei sp. nov.

♀. Length a little over 5 mm.; head and thorax yellowish-green, abdomen and legs bright apricot-color; wings hyaline, stigma and nervures pale yellowish-brown, outer nervures of third s. m. and third discoidal evanescent; mesothorax granular. Face pruinose with short white hair; lower margin of clypeus rather broadly black; front minutely granular; labrum pale reddish; mandibles light yellow except apex and base; antennæ ferruginous, apical half of scape above, and flagellum above suffusedly, infuscated; scutellum brassy, contrasting with the pure green of the mesothorax; area of metathorax broad, ill-defined, obliquely wrinkled; posterior truncation with a sharp lateral edge nearly to the top, tegulæ clear testaceous; third s. m. about as broad as second, second receiving first r. n. some distance from end; tubercles light yellow with a dark mark; coxæ dark; abdomen smooth and shining, with very shanty pale hair.

In my table of Australian *Halicti* (Ann. Mag. Nat. Hist., Sept., 1904) this runs to 11, and runs out because the abdomen is all red, except a very small dark spot on extreme lateral margins of segments 3 and 4. By the black spots at sides 3 and 4 it resembles *H. punctatus exlautus* Ckll., but is

easily separated from that by the granular, minutely punctured mesothorax, and the green metathorax and pleura.

Hab.—Mackay, Queensland, at flowers of *Eugenia*, Nov., 1899 (*Turner* 7a). This and the following species are named after men who are or were connected with Australian science.

Halictus tatei sp. nov.

♀. Length about 5 mm.; head black; thorax black, with the mesothorax green and the tubercles ferruginous; femora and the very robust hind tibiæ black, ferruginous at apex; the other tibiæ and the tarsi rather dark ferruginous, the middle tibiæ suffusedly more or less infuscated; abdomen with the first two segments chestnut-red, the others very dark reddish, or the whole abdomen very dark, except the paler apex.

Mandibles yellowish in middle, red at apex; scape long and slender, ferruginous, the upper half fuscous above; flagellum dark, scarcely at all reddish beneath; mesothorax dullish, minutely granular; scutellum shining; area of metathorax large, minutely wrinkled; tegulæ shining rufotestaceous; wings hyaline, rather yellowish, the large stigma dark sepia, nervures very dilute sepia; third t. c., etc., weakened; second s. m. much broader below than above, receiving first r. n. before its end; abdomen shining, with a microscopic transverse lineolation.

Runs in the table to 11, but differs in the coloration of the abdomen. It is nearest to *H. sphecodoides*, but the middle tibiæ are red, and the abdomen is not black at base, though the first segment has a large black spot on each side near base (obscure in the darker variety). It may prove to be a local race of *sphecodoides*.

This and the last species belong to the subgenus *Chloralictus*.

Hab.—Mackay, Queensland, at flowers of *Eucalyptus*, March, 1900 (*Turner*). Variety with darker abdomen; Mackay, May, 1900 (*Turner* 7b).

Halictus (Chloralictus) urbanus Smith.

A female in the Berlin Museum (17031) was collected in Australia by Schultz. This was no doubt M. Schultz of Port Darwin; cf. Proc. Australasian Assoc. Adv. Sci., xi, p. 199.

Halictus (Chloralictus) humilis Smith.

Two females from Adelaide (*Schomburgk*) are in the Berlin Museum. In one, the legs are practically all black, with red knees; in the other the tibiæ and tarsi are ferruginous, and the middle and hind femora largely reddish. In the latter the stigma and nervures are pale ferruginous, in the former the stigma is darker, though not very dark. Both spurs of the hind tibiæ are alike, finely ciliate. The type locality of *humilis* was Champion Bay, which is certainly a long way from Adelaide; but so far as I can tell from Smith's description and my notes on his type, the present insect is true *humilis*. Richard Schomburgk lived at Adelaide; he forwarded to Europe plants collected by Schultz in Northern Australia, and very likely the Schultz bees may also have passed through his hands. There may be here a possible source of confusion in labels.

Halictus (Chloralictus) dampieri Ckll.

This was described from the female. I have before me two males from Mackay, Queensland, Sept., 1891 (*Turner* 661). The male is a slender insect, with a long narrow dark green abdomen; antennæ black, the long flagellum strongly crenulated beneath; lower margin of clypeus broadly dull white; knees, and all the tibiæ and tarsi ferrugïnous. Details of sculpture, etc., as in the female.

Female *H. dampieri* was taken at Mackay, at flowers of *Xanthorrhoea*, April, 1899 (*Turner* 706). A blue-green variety is from Mackay, at flowers of *Eugenia*, Nov., 1899.

Halictus flindersi Ckll., var. a.

Mackay, Queensland, March, 1892 and 1900 (*Turner* 440). This species is remarkable for having a very well formed ventral abdominal scopa of curled white hairs. In two of the specimens before me this scopa contains pollen. The "var. a," with green mesothorax and scutellum, seems to be the more normal form.

Halictus behri sp. nov.

♀. Length fully 6½ mm.; head bluish-green, clypeus a fine blue, mesothorax and scutellum shining, brilliant purple-blue; other parts of

thorax bluish-green inclining to steel-blue, not brilliant; tegulæ clear rufotestaceous; wings clear, nervures and stigma reddish-brown, outer nervures weakened as in *Chloralictus;* abdomen dark purplish, the apical segments greenish, hind margins of segments dark reddish-brown; a well formed ventral scopa of curled white hairs as in *H. flindersi;* coxæ, trochanters and femora dark, more or less metallic; knees, tibiæ and tarsi more or less ferruginous, but anterior tibia behind, middle and hind tibiæ and hind basitarsus mainly dark, though not metallic. Lower edge of clypeus fringed with yellowish hairs; mandibles ferruginous, except at base; scape long, basal half ferruginous; apical part of flagellum red beneath; area of metathorax with a very coarse reticulate sculpture; apical truncation sharply defined at sides; second s. m. rather large. Clypeus with distinct widely separated punctures; sides of front with a minute cancellate sculpture; mesothorax minutely roughened, with shallow punctures; hair of hind tibiæ and tarsi, and of abdominal scopa, very strongly plumose; hind spur peculiar, with two very large and thick obtuse teeth; abdomen with the usual fine transverse lineolation.

Close to *H. flindersi*, but differing in details of color and sculpture.

Hab.—Port Darwin, Australia, November, 1902 (*Turner*). British Museum.

Halictus woodsi sp. nov.

♀. Length about 6½ mm.; similar to *H. flindersi*, var. a, but differing thus: face narrower; upper half of clypeus brilliant green; area of metathorax longer, with more pronounced longitudinal ridges; abdomen greenish, the hind margins of the segments very narrowly but evidently red. The hind femora are distinctly twisted, and the ventral abdominal scopa is well developed. The flagellum is reddish at apex. Front transversely striate just below the ocelli, reticulate below that, but longitudinally striate on each side; mesothorax microscopically tessellate, with piliferous punctures, the anterior ones forming distinct lines, with little ridges; hind spur with large teeth.

♂. Length about 5 mm., rather slender, but looks like a female, the abdomen being short, and the flagellum comparatively short and thick, its length little over one mm.; clypeus shining, without any pale border; knees, tibiæ and tarsi ferruginous, the tibiæ more or less clouded with dusky.

Hab.—Cooktown, Australia (type locality), Oct., 1902, one female (*Turner*); Port Darwin, Dec., 1902, one male (*Turner*). British Museum.

The following table separates a number of Australian *Halictines* in which the mesothorax is not black.

Mesothorax red or fulvous.....1.
Mesothorax green or blue.....2.
1. Abdomen black, slightly stained with red.
Parasphecodes callomelittinus Ckll.
Abdomen fulvous, slightly stained with blackish.
Halictus rowlandi Ckll.
2. Abdomen marked with yellow....**Nomioides perditellus** Ckll.
Abdomen not marked with yellow.....3.
3. Abdomen red or reddish, at least in part.....4.
Abdomen black.....5.
Abdomen green or blue or greenish or bluish.....6.
4. Abdomen entirely bright red.....**Halictus eyrei** Ckll.
Abdomen dark or dusky.....**H. tatei** Ckll.
5. Metathorax green.....**H. urbanus** Sm.
Metathorax black.....**H. humilis** Sm.
6. Tibiæ red (males).....7.
Tibiæ dark, sometimes with some red.....8.
7. Flagellum long; abdomen yellowish-green....**H. dampieri** Ckll.
Flagellum short; abdomen bluish.....**H. woodsi** Ckll.
8. Mesothorax brilliant blue.....**H. behri** Ckll.
Mesothorax green.....9.
9. Area of metathorax feebly sculptured.....**H. dampieri** Ckll. ♀.
Area of metathorax strongly sculptured.....10.
10. Head broader.....**H. flindersi** Ckll.
Head narrower.....**H. woodsi** Ckll. ♀.

Halictus ewarti sp. nov.

♀. Length nearly 7 mm.; head and thorax black, abdomen entirely bright chestnut-red; femora black, red at apex; tibiæ and tarsi entirely clear red, with yellowish hair; wings slightly dusky, stigma and nervures dilute sepia. Head about as broad as long; mandibles bidentate, ferruginous; clypeus and supraclypeal area very shiny, with scattered punctures; front and upper part of head generally with extremely dense large punctures; posterior orbital margins with a series of little ridges; scape long; flagellum thickened apically, ferruginous beneath, the last few joints also above; mesothorax very strongly and densely punctured, but in middle the punctures are separated sufficiently to show the shining surface; area of metathorax large, squarely cut off behind, shining, and with very strong, irregular, coarse ridges, like a *Sphecodes;* tubercles densely covered with pale ochreous hair; pleura with exceedingly rough coarse sculpture; tegulæ shining rufopiceous; first r. n. joining second s. m. (which is not especially narrow) before the end; second t. c. on one side with the upper three-fourths wanting; hind spur microscopically serrate; abdomen smooth, almost wholly without punctures, but the third and following segments evidently hairy.

This is quite unique among the Australian species, having the appearance of a *Sphecodes*, but possessing the caudal rima, caudal floccus at base of hind legs, etc., of *Halictus*. The abdomen is very hairy beneath, but in the specimen before me, pollen has been collected mainly on the hind femora.

Hab. — Cairns, Queensland, "Kur., 1. 02" (*Turner*). British Museum.

Halictus hedleyi sp. nov.

♂. Length about 5½ mm.; head and thorax black, abdomen and legs mainly red; agrees with discription of *Sphecodes tasmaniæ*, except as follows: vertex with a very faint bluish tinge, and the mesothorax perhaps slightly blue-black, but so slightly that it is doubtful; facial quadrangle not broader than long, eyes strongly converging below; flagellum clear light ferruginous beneath; scape rather short; second and third antennal joints very short, about equal, fourth much longer; mesothorax, and especially scutellum, more hairy; thread-like longitudinal striæ occupying only about basal half of metathoracic enclosure, but these very distinct and regular; tegulæ clear light reddish-testaceous; second s. m. receiving first r. n. much beyond middle; third s. m. not longer than second; hind tibiæ and tarsi entirely clear red; second and third abdominal segments, and much of fourth, red, the hind margins broadly darkened; a small black spot at each extreme side of second and third; vertex clear red. The broad apical plate is just as in *Sphecodes* subg. *Proteraner*.

I think this is unquestionably congeneric with *S. tasmaniæ*, but I now incline to consider both referable to a gruup distinct from typical *Halictus*, but not at present to be generically separated. The other species will, therefore, stand as *Halictus tasmaniæ* (Ckll.). The discovery of the females is much to be desired.

Hab.—Port Philip, Australia (*Coulon*). Berlin Museum, 2248.

Halictus bicingulatus Sm., var. a.

♀.—Rather less robust, area of metathorax smaller, hair on outer side of hind tibiæ pale except at base.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 699). British Museum.

This has a patch of fulvous hair on postscutellum, but so has typical *bicingulatus*, contary to the statement in my table.

The specimens without the patch were *rufipes* Sm. (*tertius* D. T.), but I think they are all varieties of a single species. I have a specimen of true *bicingulatus* from Smith's collection.

Halictus forresti Ckll.

♂.—The flagellum varies to obscurely dull reddish beneath, and the mesothorax, especially posteriorly, may be quite shiny. Mr. Turner took it at Mackay, March, 1900. *H. sturti* Ckll. was also taken at Mackay in the same month.

Halictus blackburni sp. nov.

♀. Length about 6 mm.; black, the head and thorax with rather scanty dull white hair; mesothorax dull, with a faint suggestion of greenish; abdomen shining, without hair-bands or patches, and the margins of the segments not at all pallid. Mandibles ferruginous subapically; tongue short dagger-shaped; face broad; flagellum obscurely brown beneath; area of metathorax with fine longitudinal rugæ, connected more or less by cross-lines, and not reaching the hind margins; tubercles densely covered with grayish-white hair, but not postscutellum; tegulæ dark reddish; wings hyaline, nervures and stigma dark rufo-fuscous, outer nervures of third s. m. and discoidal much weakened; second s. m. broad, little narrowed above; first r. n. meeting second t. c.; legs black, with white hair, more or less yellowish on inner side of tarsi; small joints of tarsi becoming ferruginous; fourth and following segments of abdomen with some long fuscous hair above; venter with curled white hair, forming a scopa. The following characters are microscopic: abdomen impunctate, microscopically transversely lineolate; mesothorax minutely tessellate, with scattered very shallow and inconspicuous hair-punctures (not visible with a lens); tegulæ lineolate; front sculptured like mesothorax, and not at all grooved; hind spur with four stout teeth, the last minute.

♂.—Much more slender; all the tarsi clear ferruginous, and a ferruginous spot at base and apex of tibiæ; second s. m. narrower; lower margin of clypeus rather broadly light yellow; antennæ only moderately long, dark.

Hab.—Mackay, Queensland; females (including type) at flowers of *Xanthorrhœa*, April and May, 1899, and at *Eucalyptus*, March, 1900 (*Turner* 915); males at *Xanthorrhœa*, Arpil, 1899 and 1900 (*Turner* 8a). Not closely related to any other species, but superficially like *H. sturti*.

Halictus stirlingi sp. nov.

♀. Length about 6½ mm., very robust, rather suggesting a *Nomia*; black, the abdomen shining, hair of head and thorax pale ochreous, on

disc of mesothorax short and dark fuscous, dense and ochreous on upper border of prothorax and on tubercles, very dense and fulvous on postscutellum; head broad; mandibles dark, the extreme apex ferruginous; scape long, black; flagellum black at base, beyond with a dusty appearance, the apex red beneath; face and front malleate, with large dense shallow punctures, while on the mesothorax this is modified into a cancellate sculpture, the depressions separated by fine ridges, the general effect without high magnification being that of a very coarsely roughened dull surface; area of metathorax dullish, with a very coarse open network of raised lines, the longitudinal rugæ more numerous and prominent than the transverse ones; pleura rough; posterior face of metathorax finely grayish pruinose; tegulæ shining rufopiceous; wings slightly dusky, stigma and nervures reddish-sepia; second s. m. rather broad, but much smaller than third, receiving first r. n. well before the end; outer nervures scarcely weakened; legs black with yellowish hair, the tarsi more or less ferruginous; hind spur with a few very large teeth; abdomen with bands of dense fulvous tomentum at bases of second and third segments; first segment delicately punctured at sides, but scarcely at all in middle; second and third finely and closely punctured all over; caudal rima fulvous, with brown hair on each side; much orange pollen collected on hind femora and basal half of abdomen beneath.

Evidently related to the *H. bicingulatus* group, but easily known by the small size, dark legs, and peculiar sculpture of metathorax.

Hab.—Mackay, Queensland, April, 1900 (*Turner* 1081).

Halictus maitlandi sp. nov.

♀. Length about 7 mm., robust, superficially similar to *H. stirlingi*, but structually very different; black, head, thorax and abdomen dullish, with a sericeous lustre; hair of head and thorax pale, very scanty, except that the tubercles, adjacent lateral lobes of mesothorax, and the postscutellum, are very densely covered with fulvous hair; the sides and truncation of the metathorax also have much pale hair; head broad, the scanty hair of face yellowish; mandibles dark, a little reddish at base; scape red, black at apex, flagellum black; front with a microscopic tessellate sculpture running into fine lineoles, under a lens having a dullish submetallic sheen; mesothorax impunctate, under a high power of the microscope densely covered with minute file-like striæ; scutellum like front, and with a few minute punctures; area of metathorax large, dull and granular; tegulæ ferruginous, with some fulvous hair in front; wings rather dusky, the marginal cell and apical field beyond clouded with dark fuscous; stigma and nervures piceous; second s. m. larger than third (third remarkably short), first r. n. joining second t. c., b. n. less bent than usual; femora black,

tibiæ and tarsi rather dark chestnut-red, hind spur with four very stout blunt teeth, the last small; hind tibiæ and tarsi with much black hair; second and third abdominal segments each with a very even, clean-cut dense band of light fulvous hair; surface of abdomen microscopically transversely striatulate; fourth and fifth segments also with basal hair-bands, but these are almost wholly concealed by the segments before; hind margins of segments not at all pallid; caudal rima yellowish; sides of apical segment with long dark hairs; venter with a pale curled scopa.

A very curious species, combining the characters of the very dissimilar *H. stirlingi* and *H. blackburni*.

Hab.—Cairns, Queensland, "Kur., 3. 02" (*Turner*). British Museum.

Halictus davidis sp. nov.

♀. Length about 10 mm.; rather robust, black, the abdomen shining coal-black without hair-bands or patches; resembles *H. carbonarius* Sm., but less strongly punctured. Mandibles black; clypeus shining, with sparse small punctures; scape black, flagellum faintly brownish beneath; front with scattered small punctures; ocelli amber-color, in a low triangle; vertex and sides of front with dark fuscous hair; mesothorax smooth, with a strong glaucous tint, and small scattered punctures, its anterior and lateral margins rather densely clothed with black hair; pleura strongly, mainly vertically, striate, with pale hair; upper margin of prothorax, and tubercles, especially the latter, densely fringed with white hair; area of metathorax ill-defined, except behind, where it is limited by a very sharp and prominent transverse rim; surface of area with a feeble rugose sculpture, the plicæ ill-defined and very weak; tegulæ piceous; wings strongly infuscated, brownish, nervures and stigma sepia; second s. m. rather large, receiving first r. n. at its apical corner; third s. m. much larger than second; legs black, the femora with white hair, tibiæ and tarsi with hair nearly all black; spurs ferruginous, hind spur with very fine teeth or spines, abdomen with very fine and minute punctures, the second and third segments also microscopically transversely lineolate; sides of abdomen, and apical half of venter, with black or dark fuscous hair; basal half of venter with white hair, more or less curled, forming a scopa.

♂. Length about $8\frac{1}{2}$ mm.; much more slender; greater part of clypeus light yellow, but the margin ferruginous; flagellum very long, strongly crenulate and dark coffee-brown beneath; area of metathorax larger and rather more strongly sculptured; first r. n. meeting second t. c.; anterior tibia red in front, tarsi becoming red at apex, tibiæ and tarsi with pale hair, a little dark on anterior and middle tibiæ. The striated pleura and glaucous mesothorax as in the female.

Hab.—Cairns, Queensland, "Kur., 4. 02" (*Turner*). British Museum.

The female is the type.

Halictus papuarum sp. nov.

♀. Length about 5 mm.; black, face, front and mesothorax dull, the scutellum more shining; abdomen brownish, very dark, disc of first segment dark reddish, no hair-bands or patches, but apical segment with much yellowish hair; wings somewhat dusky, nervures and stigma piceous, third t. c. and second r. n. much weakened. Head broad; mandibles bright ferruginous; antennæ dark, scape reddish at extreme base, flagellum brownish beneath; clypeus, face and front without evident punctures, the front microscopically tessellate; mesothorax microscopically tessellate, with scattered extremely minute punctures; scutellum similar but smoother; area of metathorax having fine irregular anastomosing rugæ on its basal half, its apical rim distinct, shining; posterior truncation hairy; sides of metathorax with long hair; tegulæ light yellowish-testaceous; second s. m. very narrow, much higher than broad, receiving first r. n. very near its apex; third s. m. broad below, narrower above, the third t. c. with a single gentle curve; legs black, with pale yellowish hair, the knees more or less red; the tarsi ferruginous, the basitarsi more or less dusky; anterior basitarsus rather broad; hind spur with three very large blunt teeth, the other spur of hind tibia minute ciliate (denticulate); abdomen microscopally transversely lineolate, the hind margins very slightly rutescent; a copious ventral abdominal scopa.

Related to *H. latitarsis* Friese, but smaller, with red mandibles.

Hab.—New Guinea, "Kai Tubaut, '09" (*Dr. Neuhauss*). Berlin Museum.

A very commonplace little species, chiefly noticeable for its small size.

Halictus lanarius Smith.

This was based on a female from Hunter River, New South Wales. Five females are in the Berlin Museum, four from Adelaide (*Schomburgk*), one from "New Holland" (*Shotzki*). The hind spur is peculiar, being apparently simple except for a very large broad truncate tooth near the base; with a high power of the microscope, the simple part is seen to be obscurely subdenticulate. I think *H. lanuginosus* Sm. is the male of this. Smith recognizes a female

lanuginosus, but says the clypeal margin is white; the antennæ of this species are short in the male, simulating a female, and readily accounting for the mistake. A male in the Berlin Museum is from Adelaide (*Behr*), and has been labelled by someone "*Halictus infimus* Er. ??." Erichson's species was described as an *Andrena* in 1841; it may belong to *Halictus*, but the description is insufficient for its identifition. Another male, from Adelaide (*Schomburgk*), is rather less robust, and the second s. m. is very small and narrow. It is evidently an abnormal specimen. A female from Adelaide (*Schomburgk*) is smaller than usual (8 mm.), with the hind spur nodulose, and the tegulæ lighter. I was at first inclined to believe it distinct, but now conclude that it is only an individual aberration.

Halictus cambagei sp. nov.

♂. Length about 5½ mm.; black, with the abdomen and legs very dark brown, whole insect hoary with grayish-white pubescence. This is a male having relatively short antennæ, and a robust form, exactly simulating a female, and evidently to be associated with *H. lanarius*, from which it is easily known by its small size and shining mesothorax. Head broader than long; face broad, with much white hair; lower half of clypeus cream-colored, the edge very narrowly ferruginous; mandibles ferruginous except at base; scape rather short, shining black; flagellum obscurely brownish; face and clypeus shining, front dull; with a microscope the front is seen to be densely minutely punctured; mesothorax very shiny, with scattered evident punctures, the microscope showing a smooth surface, with occasional very minute punctures between the larger ones; scutellum brilliantly shining; area of metathorax with a very minute irregular reticulate sculpture, and a broad smooth shining rim; posterior truncation hardly defined; tegulæ shining rufous; wings hyaline, iridescent, nervures and stigma dull reddish-brown, not dark; second s. m. broad, receiving first r. n. very near end, third t. c. greatly bulging outwards; knees and tarsi rather obscure reddish; abdomen shining, thinly pilose, no hair-bands, nor any distinct patches, though the hair is a little more dense at sides of base of second and third segments, in some specimens forming obscure patches; second and third segments with very fine rather close hair-punctures. The second r. n. and third t. c. are very distinct, not very weak or almost obsolete as in *H. humei* and *H. globosus*.

Hab.—Adelaide, Australia (*Behr*). Berlin Museum; four males.

A small male *Halictus* from Adelaide (*Schomburgk*), about 6 mm. long, has the robust form of a female (even robust for a female!), and the clypeus all black; the flagellum is ferruginous beneath, strongly crenulate in profile, the middle joints about as broad as long. The specimen has been in some liquid, and is not in condition to be properly described. It is related to *H. oxleyi* Ckll., but differs at once by the shiny mesothorax, etc.

Halictus leai sp. nov.

♀. Length nearly 9 mm.; black, the hind margins of the abominal segments broadly ferruginous; pubescence in general scanty, pale yellowish, glittering white on cheeks beneath; femora rufofuscous, ferruginous at end, tibiæ and tarsi clear ferruginous, with pale yellowish hair; hind spur with a very large basal tooth, and beyond (apicad of) it a large nodule. Head broad; mandibles red in middle; clypeus shining, with conspicuous punctures of different sizes; front dull, granular from excessively close minute punctures; flagellum obscure brownish beneath; sides of upper border of prothorax, margin of tubercles, and postscutellum densely clothed with light fulvous tomentum; mesothorax strongly and densely punctured, but shining between the punctures; punctures of scutellum much smaller than those of mesothorax; area of metathorax ill-defined, coarsely granular, microscopically reticulate; posterior truncation sharply defined, minutely hairy; tegulæ shining rufofulvous; wings moderately dusky, nervures and stigma reddish-testaceous; second s. m. broad below, receiving first r. n. before its end; third s. m. large, outer nervures weakened; abdomen dullish, granular (minutely densely punctured), the apical margins of the segments broadly subhyaline ferruginous, and the extreme bases with entire bands of light fulvous tomentum; venter with much pale hair, which is used to gather pollen, though not nearly so much as the scopa of hind legs.

Related to *H. bicingulatus*, which it superficially resembles, but abdomen very much broader at base, scape black, etc.

Hab.—Victoria (*C. F.*; Turner collection). British Museum.

Parasphecodes callomelittinus sp. nov.

♀. Length about 8½ mm., wings very long and ample; head black, the front dull and granular, the face more shining; ocelli small; mandibles bidentate; clypeus very small; supraclypeal area large, convex; scape long; flagellum short, obscure reddish beneath; hair of

head and thorax very scanty, white below, mostly fuscous above; mesothorax, scutellum, postscutellum (except at sides) and pleura dull ferruginous, the color exactly as in *Callomelitta;* prothorax black, with the anterior border, next to occiput, red; metathorax black, shining, the area dull, not clearly defined; mesothorax shining, with minute scattered punctures; tegulæ shining dark reddish; wings dusky, but considerably paler than in *Callomelitta;* stigma and nervures very dark brown; lower section of b. n. strongly bent, falling short of t. m.; first r. n. joining second t. c.; third s. m. subquadrate, the second and third together not quite so long as first; legs very dark brown, the anterior and middle femora black, with red knees; hind femora with a white, curled, polleniferous scopa; hind spur simple; abdomen shining black, the first two segments, and the hind margins of the others, very obscurely reddish; no hair-bands; apex with dark fuscous hair; venter with glittering white hair.

A very singular species, almost perfectly imitating *Callomelitta*, and also looking not unlike an ant. I place it in *Parasphecodes* rather than *Halictus*, as it has the general build and simple hind spur of that genus. It will be easily known by the *Callomelitta*-like coloration.

Hab.—Melbourne, Victoria, Aug., 1900 (*C. F.;* Turner collection). British Museum.

Parasphecodes contaminatus sp. nov.

♂. Lenth about 8 mm.; slender, light rufofulvous (approaching orange), with the head blackish, but the clypeus pale yellowish (strongly contrasting with the dark supraclypeal area); the mesothorax (except at sides) and a large patch on mesopleura dark brown (probably black in some; the specimen seems slightly immature); fourth abdominal segment with the apical margin broadly brownish, fifth and sixth with the apical half shining very dark brown; legs wholly without dark color. Hair of head and thorax very short moss-like, light ochreous; eyes large, converging below; face narrow; antennæ light fulvous, the flagellum dusky above except at base; mesothorax shining, bare except around margins; area of metathorax large, without evident sculpture except oblique striæ at sides; tegulæ pale testaceous; wings ample, with a large dark cloud occupying the marginal cell, below and beyond, but not the apex of the wing, though that is darker than the part before the cloud; nervures and the large stigma dark fuscous; first r. n. joining second t. c.; abdomen parallel-sided, apex rounded. Third joint of maxillary palpus with the apical two-thirds very dark; scape very short; mesothorax with very fine punctures; abdomen very minutely roughened.

Known from all other species by the entirely red metathorax and clouded wings.

Hab.—Cairns, Queensland, "Kur., 1. 02" (*Turner*). British Museum.

Parasphecodes schomburgki sp. nov.

♀. Length about 8½ mm., robust; head and thorax black, with grayish white hair (no black); abdomen rich chestnut-red, the fourth segt ment except base and the apex, dark but not black; first two segments finely punctured; wings hyaline, slightly reddish, stigma and nervures light ferruginous, first r. n. entering second s. m. a short distance before end, second s. m. about as broad as high; second r. n. and third t. c. weakened. Tongue short, pointed, apparently broader than long: joints 3 to 5 of maxillary palpi broad and oblique at apex, with the apical corner somewhat produced; mandibles dark reddish except at base; face broad; clypeus and supraclypeal area microscopically sculptured, and with large well separated punctures; sides of face minutely wrinkled and very densely punctured; front extremely densely punctured; extreme base of scape minutely closely punctured, but the shaft microscopically lineolate; antennæ entirely ferruginous, the scape dusky, the flagellar sutures dusky above; mesothorax dull, minutely granular-punctate; area of metathorax rather coarsely longitudinally wrinkled, nearly its apical third smooth; apical truncation of metathorax heart-shaped, well-defined, smooth and shining, with a deep median sulcus; pleura rough; tegulæ shining chestnut-red; legs dark ferruginous, with pale yellowish hair; hind spur simple; abdomen moderately hairy.

In my table of *Parasphecodes* (Ann. Mag. Nat. Hist., Sept., 1904) this runs nearest to *P. lithusca*, but is separated by the character of the metathorax.

Hab.—Adelaide, Australia (*Schomburgk*). Berlin Museum, 22122. This locality seems to be rich in *Parasphecodes*, having already furnished *P. hilactus* Sm., *P. adelaidæ* Ckll., *P. loweri* Ckll. and *P. tepperi* Ckll.

Parasphecodes sextus sp. nov.

♂. Length about 9 mm.; head and thorax black, with pale hair, faintly tinged with ochreous above; abdomen rather robust, the first three segments a very fine chestnut-red, without dark markings, the fourth and following ones black; fourth ventral with a large red mark; femora reddish-black, the knees ferruginous; anterior and middle tibiæ and tarsi clear red, with pale golden hair; hind tibiæ and tarsi red, but much darker; wings ample, hyaline, a little dusky in apical

field, but nowhere dark; stigma and nervures amber-color, first r. n. meeting second t. c.; second s. m. broad, but third much larger. Face covered with dull pale ochreous hair; eyes strongly converging below, inner orbits with a double curve; tongue and maxillary palpi as in *P. schomburgki;* clypeus with the lower half light yellow, sending a median projection upwards; scape dark, extremely short; flagellum very long, at least $5\frac{1}{2}$ m.m., strongly crenulate beneath, its lower side entirely red except the very short first joint, the slightly longer second joint clear red, contrasting; front, vertex, mesothorax and scutellum dull, densely granular-punctate; area of metathorax entirely covered with coarse rugæ; apical truncation rather small, hairy, ill-defined; tegulæ rather large, apricot-color; first two abdominal segments finely punctured, as in *P. schomburgki.*

The difference in venation, and the marked difference in the structure of the metathorax seem to indicate that this cannot be the male of *schomburgki.* It seems nearest to the Tasmanian *P. altichus* Sm., but differs by the excessively fine dense punctuation of the mesothorax, the poorly defined metathoracic truncation, the red tibiæ, etc.

Hab.—Adelaide (*Schomburgk*). Berlin Museum, 22114.

Parasphecodes froggatti Ckll.

Victoria (*C. F.;* Turner collection). British Museum.

Parasphecodes vulneratus sp. nov.

♂. Length hardly 9 mm.; abdomen much smaller and less robust than in *P. froggatti;* head and thorax black, with grayish-white hair, pale fuscous on vertex, scutellum, and slightly on hind part of mesothorax; dense hair of face grayish-white; clypeus produced, its lower half pale yellow, with the usual upward projection; antennæ appearing entirely black (flagellum broken in middle), but close inspection shows a small red spot on third joint, and a reddish suffusion on under side of flagellum beyond; ocelli in more of a triangle than in *P. sextus;* front vertex, mesothorax and scutellum uniformly exceedingly minutely granular punctate; area of metathorax semi-lunar, with longitudinal wrinkled rugæ extending to posterior margin; posterior truncation as in *P. sextus;* tegulæ piceous with the outer part broadly pale ferruginous; wings moderately dusky, the apex a little darker, stigma and nervures very dark reddish-brown; outer nervures strong; first r. n. meeting second t. c.; second s. m. higher than broad; legs slender, moderately hairy, shining black, the knees, anterior tibia in front and middle tibia at apex, red; abdomen with the basal part finely punctured; first three segments bright chestnut-red, the others black, except a red spot on middle of fourth.

This may be the male of some described female, but if so, I cannot guess which. It seems nearest to *P. hilactus* Sm., but differs conspicuously in the color of the legs.

Hab.—Victoria (*C. F.;* Turner collection). British Museum).

Parasphecodes cirriferus sp. nov.

♀. Length about 12½ mm., anterior wing 8; head and thorax black, with pale hair, which is strongly ochreous-tinted on head and thorax above, the dense fringe of the tubercles is also ochreous; head broad; clypeus broad, little produced, shining, with a median groove, and sparse very strong punctures, it is also wholly black; from beneath margin of clypeus projects a long fringe of golden hairs; mandibles bidentate, with a dark red band; front densely granular-punctate; ocelli forming a curved line rather than a triangle; scape long; flagellum, except at base, very obscurely reddish beneath; mesothorax with the median and parapsidal grooves distinct, everywhere very densely rugosopunctate except the disc beyond the middle, where the punctures are larger and evidently separated, showing the shining surface between (this peculiarity is very distinctive of the species); pleura transversely, more or less obliquely, striate, the striæ on the posterior part coarser and stronger; area of mesothorax coarsely, very irregularly wrinkled, with a strong posterior margin; posterior truncation heart-shaped, well-defined, smooth and brilliantly shining, with a strong median sulcus, which is beset with reddish hairs, increasing to form a conspicuous tuft, extending on either side, at its upper end; tegulæ shining rufous, dark basally; wings strongly reddish-dusky, the nervures fuscous, the large stigma redder; second s. m. broad, first r. n. joining second t. c.; b. n. falling very little short of t. m.; legs with pale hair, ferruginous on inner side of tarsi; hind trochanter and femora with a large plumose scopa; hind tibiæ very hairy; hind spur ciliate; abdomen dark chestnut-red, the fourth and following segments black, and from the third on with much coarse black hair; basal part punctured much as usual, but not uniformly.

Known by its large size, dusky wings, tufted truncation of metathorax, etc. It seems nearest to *P. tilachus* Sm., but that is smaller, with the clypeus produced. In *P. tilachus* the second r. n. and third t. c. are much weakened, in *cirriferus* they are slender, but still dark and conspicuous.

Hab.—Victoria, Australia (*C. F.;* February, 1901; Turner collection). British Museum.

Two large rufofulvous mites are attached to the metathorax.

Parasphecodes vau sp. nov.

♀. Length about 8 mm.; head and thorax black, the clypeus marked with obscure red in the same manner as it is marked with yellow in the males; abdomen robust, with the usual fine punctures, dark red, including the fourth segment, first segment with a large thick inverted V in black, no patches of hair, but apical half of abdomen thinly hoary, third and fourth segments with scattered black bristles, apex with black hair; femora black, red at apex, tibiæ and tarsi red; middle tibiæ with fuscous hair on outer side; hind spur minutely denticulate; tegulæ clear red; wings very dusky, the apex not noticeably darker than the rest; stigma and nervures rufotestaceous, second s. m. about square, first r. n. joining second t. c.; scutellum and postscutellum covered with dense moss-like ochreous tomentum, the short hair of head and thorax above generally, and the dense fringe around tubercles, ochreous, but on the ventral surface of thorax and abdomen it is white. Head broad; apical half of mandibles dark red; flagellum dull ferruginous beneath; hair of face ochreous; front dull, densely rugosopunctate; mesothorax rather shining, with small and close but distinct punctures; area of metathorax shining, its basal half with very fine striæ; posterior truncation smooth, without any tuft at top; pleura granular, posteriorly striated.

Nearest, I think, to *P. lacthius* Sm., but distinguished by the color of the clypeus, the sculpture of the metathorax, etc. By the dark wings it recalls the much larger *P. cirriferus*.

Hab.—N. W. Australia (*C. F.*; Turner collection). British Museum.

Parasphecodes basilautus sp. nov.

♀. Length about 8 mm.; very close to *P. vau*, with the same general form and colors, red area on clypeus (but more extended, leaving only a couple of semi-circular black areas), sculpture of front, mesothorax and metathorax (but striæ of last rather finer and more regular), ochreous hair-patch covering scutellum and postscutellum, etc. The differences are as follows: red area of clypeus dull, impunctate (in *vau* shining, with a few large punctures); head smaller; when metathorax is seen from above, the corners bounding truncation are much less angular; wings hyaline orange-tinted, the apex faintly dusky; femora red, a little blackened at base; hair on outer side of middle tibiæ entirely pale golden, as is all the hair on tibiæ and tarsi; first two abdominal segments entirely red, third red with a median black suffusion on basal half, fourth and following black, with coarse black hair.

♂. Similar but not so robust; wings rather more dusky, and hardly yellowish; fourth abdominal segment black with the apical margin broadly yellowish subhyaline, but fifth and sixth black to margin;

face, except clypeus, with dense ochreous hair; clypeus with the lower half and a conical projection upwards light yellow; scape short and black; flagellum long, clear ferruginous beneath; fine striæ on area of metathorax covering about two-thirds of surface.

Among Smith's males this may be compared with *P. altichus*, but differs at once in the color of the legs, the tibiæ and tarsi being entirely red, the femora red in front, but with the basal three-fourths black behind.

Hab.—Cairns, Queensland, "Kur., 4. 02" (*Turner*). British Museum. The female is the type.

The following table separates a series of Australian Halictiform bees in which the mesothorax is black (in *P. contaminatus* dark brown), and the abdomen is at least mainly red or rufofulvous.

Metathorax and abdomen rufofulvous.
Parasphecodes contaminatus Ckll.
Metathorax black ..... 1.
1. Metathorax with very strong rugæ, and mesothorax very coarsely punctured; *Sphecodes*-like species..... 2.
Metathorax without such strong rugæ, and mesothorax finely punctured..... 3.
2. Tibiæ clear red..... **Halictus ewarti** Ckll.
Tibiæ dark ..... **Sphecodes profugus** Ckll.
3. First r. n. entering second s. m..... 4
Ftrst r. n. joining second t. c.; none of the species small..... 5.
4. Small, length a little over 5 mm.; apex of male abdomen as in *Proteraner* ..... **Halictus hedleyi** Ckll.
Much larger; flagellum red above and beneath.
Parasphecodes schomburgki Ckll. ♀.
5. Tibiæ and tarsi red; clypeus partly red (♀) or yellow (♂)..... 6.
Tibiæ and tarsi mainly dark..... 8.
6. Scutellum and postscutellum densely covered with ochreous moss-like hair..... 7.
Scutellum and postscutellum without such hair..... **P. sextus** Ckll.
7. Abdomen dark reddish, segments 3 and 4 about same color; first segment with a reversed black V..... **P. vau** Ckll.
Abdomen bright chestnut-red, in female wholly black beyond third segment; no V on first segment..... **P. basilautus** Ckll.
8. Larger, general color of thoracic hair ochreous or fulvous.
P. cirriferus Ckll.
Smaller, general color of thoracic hair white..... 9.
9. Larger, hind legs more hairy..... **P. froggatti** Ckll.
Smaller, hind legs less hairy..... **P. vulneratus** Ckll.

Sphecodes profugus sp. nov.

♀. Length about 9 mm.; head and thorax black, abdomen dark castaneous, black at apex; hair of head and thorax scanty and white, more abundant on sides of thorax and on face; head large, broader than long (breadth about 3 mm.), but not nearly twice as broad as long; mandibles black, faintly reddish in middle, with a well developed inner tooth; process of labrum deeply emarginate; antennæ entirely black, third joint bulging beneath, flagellum short; front minutely rugose; mesothorax and scutellum shining, with large punctures, well-separated except at sides; base of metathorax shining, divided by strong ridges into a number of irregular polygonal spaces; tegulæ shining piceous; wings moderately dusky, stigma and nervures very dark brown; second s. m. very narrow, receiving first r. n. some distance before its end; third s. m. large; legs black with light hair, small joints of tarsi ferruginous; hind spur simple; no evident scopa, abdomen shining, first segment with very minute widely scattered punctures; a slight depression at base of second segment (visible in lateral profile); apex hairy.

♂. Length about 7 mm., much less bulky; abdomen lighter red, distinctly punctured, the first segment much more distinctly and closely than in the female; legs brownish; scape very short; flagellum robust and long, very strongly crenulated, the joints nodose beneath.

The tongue in this species is extremely short, forming nearly an equilateral triangle. The sexes were associated by the collector, and no doubt belong together, in spite of the difference in abdominal punctuation. The insect is allied to *S. biroi* Friese, from New Guinea, but much larger.

Hab.—Mackay, Queensland, May, 1900 (*Turner*, 94). British Museum. The female is the type.

Apis mellifera ligustica Spinola.

Boulder, Colorado, freely visiting *Tragopogon porrifolius* L., sucking. Knuth cites no visitors of this plant.

Gastropsis pubescens (Smith).

Victoria, Australia (*C. F.;* Turner collection). British Museum.

Emphor bombiformis (Cresson).

Fedor, Texas, July, 1909, at flowers of a Malvaceous plant, thought to be *Fugosia* (*Birkmann*). Mr. Birkmann writes that he has been collecting bees in this vicinity for twenty-five years, and never saw *Emphor* until 1909.

Greeleyella polytricha (Ckll.).

Mr. Birkmann sends me numerous specimens of both sexes, which he has taken mated. The female is *Greeleyella resinata* Ckll., 1910, and the male *Panurginus polytrichus* Ckll., 1909. From the description I thought it possible that Viereck's *Birkmania andrenoides* (published about twenty-five days later than *P. polytrichus*) might be the same insect, but Mr. S. A. Rohwer, after comparing my despription of *G. resinata* with Viereck's type, concludes that they are not identical. They are, however, certainly congeneric.

A male and female *G. polytricha* are marked as from flowers of *Allium*.

Nomioides perditellus Ckll.

Described from the female. The male is more slender, head greenish-blue, thorax shining blue; eyes strongly converging below; clypeus, labrum and mandibles (except rufous tips) yellow; scape extremely short, yellow in front; flagellum long, brown above, pale yellowish beneath; abdomen dark brown, with only one yellow band, on basal part of third segment, this narrowly interrupted in the middle, and squarely cut off some distance from lateral margins; apical plate broadly truncate, the truncation slightly emarginate. Female; var. a. Head and thorax yellowish-green; a short transverse yellow band on hind border of mesothorax, and a similar one on postscutellum.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 438). The sexes were associated by the collector. This is the only Australian *Nomioides*.

Trigona tescorum sp. nov.

Worker. Length about 5½ mm., short and broad, black, head and thorax dull, metathorax and abdomen shining; wings strongly suffused with reddish-brown; face broad, with a fine white pruinosity.

In Friese's table (Die Bienen Afrikas) this runs nearest to *T. clypeata*, from which it is easily known by its larger size, less shining face, clypeus not pale margined, and dark wings. In *T. clypeata* the b. n. meets the t. m., in *T. tescorum* it falls short of it. In *clypeata* the abdominal segments are

entirely shiny, in *tescorum* the hind margins of the segments are dull and granular, and the apical ones being retracted, the whole apical end of the abdomen appears dull. The hair on inner surface of hind basitarsus is dark, whereas in *clypeata* it is clear ferruginous. The flagellum is reddish beneath toward the apex, and the tegulæ are piceous. Under the microscope the mesothorax in both species shows a fine densely malleate sculpture, but although *tescorum* is the larger, the sculpture is very much finer than in *clypeata*.

Hab.—Benguella, Africa (*Wellman*, 1471). Wellman's 1243, from the same locality, is *T. gribodoi* Magr.

Trigona topiorum sp. nov.

Worker. Length about 6 mm., short and broad, black, marked with lemon-yellow; face very broad, front dull and minutely granular, supraclypeal area and lower parts of face shining; front, vertex, labrum and base of mandibles with dark reddish hair; mandibles ferruginous, yellow at base, with a long straight cutting edge, and two little long-triangular teeth at the inner apical corner; yellow markings of head consisting of a spot behind base of mandibles, a narrow stripe along anterior orbits, failing above, and a suffused mark on each side of clypeus below; scape with a red stripe, including most of base, and narrowing apically; flagellum obscurely reddish beneath; hair of thorax ferruginous, rather abundant; mesothorax and scutellum dull and granular; a yellow stripe runs along each side of mesothorax, includes axillæ, and becoming about twice as broad, margins scutellum, leaving the latter with a black semi-circular area; prothorax above (interrupted in middle) and tubercles yellow; tegulæ clear rufo-testaceous; wings yellowish, dusky hyaline, stigma and nervues ferruginous; b. n. meeting t. m.; two well defined submarginal cells; legs black, small joints of tarsi ferruginous, a dull yellow mark at base of anterior femora, and a spot at base of middle ones; hair on inner side of hind basitarsus fox-red; abdomen short and broad, piceous, not hairy, with variable light yellow lateral spots, that on second segment large and subquadrate; no bands.

Runs in Friese's table to 13, and runs out because the mesonotum is yellow margined and the abdomen is not red. Nearest, I think, to *T. conradti* Friese, but differing in many details. (I have compared an authentic *conradti*, collected by Conradt.)

Hab.—Benguella (*Wellman* H 92). Two specimens.

Trigona cincta Mocsary.

This species was described from New Guinea. In the Berlin Museum are four specimens from Australia (Hermannsburg, Finke River, *V. Leonhardi*). One of these has been labelled "*cincta?*" by Friese, and they seem to agree well with Mocsary's description, except that they are distinctly larger, up to 5 mm. long. They are allied to *T. essingtoni* Ckll., but easily separated by the coloration of the clypeus.

Trigona cassiæ sp. nov.

Very like *T. carbonaria* Sm., and is, perhaps, the species recorded from Mackay by Friese as *carbonaria*. In the worker the mesothorax is very smooth and shining; axillæ black; the prominent scutellum with a broad transverse dusky yellowish band, and all its hair dark fuscous; tubercles light-spotted; upper border of prothorax not hairy; nervures and stigma reddish fuscous, not very dark. In the male the flagellum is entirely pale fulvous beneath (obscurely reddish in *carbonaria*); the last joint is less flattened, while in *carbonaria* it is so flat at end as to appear very acutely pointed in lateral view; face narrower below than in *carbonaria*, scutellum not pale-banded. Smith does not describe the male of *carbonaria*, but I have specimens from Sydney, N. S. W.

Hab.—Mackay, Queensland, worker at flowers of *Cassia*, Dec., 1899 (*Turner*, 900); male, Nov., 1891 (*Turner*, 318). The worker is the type.

Andrena cyprica sp. nov.

♂. Length about 13½ mm., expanse nearly 24; entirely black, the head and thorax rough, the abdomen shining, nude, without bands; hair entirely black or brown-black (more evidently nigrofuscous on head and thorax above), except on inner side of tarsi, where it is ferruginous; the basitarsi at apex, and all the small joints, are ferruginous; head broad, facial quadrangle much broader than long; the abundant black hair of face erect; clypeus densely punctured, but shining between the punctures; process of labrum sharply bidentate; mandibles long, falciform, not toothed at base; cheeks extremely broad, but the posterior angle rounded; antennæ entirely dark, the flagellum thick; third antennal joint much longer than fourth or fifth, fourth a little shorter than fifth; mesothorax well punctured, but the

dull surface visible between; metathorax rounded, very rough, the area small, triangular, inconspicuous, bounded by a line; wings yellowish-hyaline, with a dark red-brown cloud occupying apex, and a cloud across second submarginal cell and into third; second s. m. very broad, receiving first r. n. before middle; abdomen fusiform, very finely punctured, second segment depressed about a third.

Near to *A. carbonaria* L. (*pilipes* Rossi), but the wings are paler basally, the abdomen is more finely punctured, and the legs are not entirely black-haired. The apical ventral segment, as in *carbonaria*, is emarginate. The *A. carbonaria* before me is from Sicily, and has the second submarginal cell narrower and more oblique than in *cyprica*. There is also a strong resemblance to *A. morio* Brullé, but that has the third antennal joint shorter, the cheeks less developed, the wings much darker, etc.

Hab.—Cyprus, March 17 (*C. Glaszner*). British Museum.

Andrena batesiæ sp. nov.

♀. Length about 14 mm., expanse 26; hair of thorax above, including tubercles, upper part of pleura and sides of metathorax, deep fox-red, as in *A. nitida*; face with rather dull fulvous hair, forming a conspicuous tuft on each side, but supraclypeal area and scape with black hair; clypeus very densely punctured, with no smooth line; process of labrum emarginate; facial foveæ dark coffee-brown, very broad, going below antennæ, separated from eye by a practically uniform narrow band; antennæ black, third joint longer than 4 + 5, but not so long as 4 + 5 + 6; lower part of pleura with the hair dusky yellowish, but middle and hind coxæ with it black; mesothorax densely punctured; metathorax very coarsely granular, the area long and very narrow, poorly defined, the sculpture hardly differentiated; hair of anterior femora beneath like that on lower part of pleura, that on inner side of anterior tarsi dull red, otherwise the hair of legs generally is black; hind spurs uniform ferruginous; abdomen broad, finely punctured, a little dull pale hair on first segment and at sides of base of second, but no evident bands of any sort; apical fimbria black; ventral segments very dark, faintly reddish; wings reddish-fuliginous, not so dark as in *A. morio*, second s. m. broad, receiving first r. n. beyond middle.

Compared with *A. nitida* (Dover, England) this is practically identical in all details of structure, and is manifestly very closely allied. It differs, however, by its much darker wings, absence of conspicuous light hair on abdomen, and color of hair of face. It is, no doubt, an insular representa-

tive of *nitida*. Compared with *A. thoracica*, var. *assimilis* Rad., it differs by the color of the spurs and some other details; I have not seen *assimilis*, but *batesiæ* is certainly not a variety of *thoracica*. It also resembles *A. pectoralis* Perez, but differs in a number of details.

Hab.—Cyprus (*Miss Bates*). British Museum.

Andrena cameroni n. n.

Andrena caroli Cameron (not of Perez, 1895). Simla. Allied to *A. mephistophelica* Cam.

Andrena sinensis sp. nov.

♀. Length about 14 mm.; thorax densely covered with bright fox-red hair; abdomen black, shining, not banded or covered with hair, the apical fimbria black; wings very dark, with a violaceous tint; pleura (except uppermost part) and pectus with black or sooty hair; hair of head black except on occiput, where it is fulvous; hair of legs black; process of labrum broad, shallowly emarginate; clypeus densely punctured but shining, without a smooth line; facial foveæ broad, very dark purplish-brown; third antennal joint longer than 4 + 5, but not so long as 4 + 5 + 6; metathorax very coarsely granular, the area scarcely distinguishable; second abdominal segment depressed fully two-fifths.

In Schmiedeknecht's table (Apidæ Europææ) this runs to *A. thoracica* var. *assimilis* Rad., except that the hind spurs are uniform rich dark ferruginous. In size and superficial appearance it is exactly like *A. batesiæ*, except for the fact that the wings are dark right to the base, while in *batesiæ* they are pallid basally. Upon close comparison the following differences from *batesiæ* are apparent: hair of face all black or sooty; abdomen without pale hair near base, and considerably less punctured. On the first segment and basal half of second the punctures are small and scattered, while on apical half of second they are still fewer and extremely minute. In *basesiæ* they are much more dense, and are so all over second segment.

Hab.—Tientsin, China, June 15, 1906 (*F. M. Thomson*). British Museum.

China must be rich in *Andrena*, but only two (*vitiosa* Sm. and *anthracina* Mor.) seem to have been described. Four others have been described by Morawitz from Mongolia.

NEW SPECIES OF NOCTUIDÆ FOR 1910.

No. 2.*

BY JOHN B. SMITH, SC.D.

Because of the accumulation of material, it has been necessary for me, recently, to rearrange some of my boxes. At every arrangement there are some specimens that do not fit satisfactorily into any named series, and are yet not so obviously different as to warrant the decision that an undescribed species is in hand. These are usually placed as possible varieties or variations to the form to which they seem most nearly allied, and left until further material is received. Sometimes years pass before an odd example is duplicated and, occasionally, around a central species a group of oddities will accumulate until lack of further space makes readjustment necessary.

In the North American species of *Euxoa* we have, among the Noctuidæ, a peculiarly difficult problem. There are a few very well marked species whose standing cannot be questioned, and we have a number of forms more or less constant and more or less local. Every collection from a single locality where large numbers of examples are taken, shows series that obviously belong together and yet vary so greatly that, were they received from different localities and with different dates, would hardly be associated. Almost every such series, however, has some characteristic appearance that is often impossible of description in words ; but is readily enough recognized by the eye of experience.

Sometimes, intermingled with such series, an oddity is discovered ; it does not differ markedly by any one strong character, but it is obviously—to the eye of experience—something that does not belong there. Once separated and with others associated with it, a distinctive habitus becomes clear and a species is fixed. Of course errors occur, for no

* No. 1, See Journal of New York Entomological Society, XVIII, pp. 85–98.

two persons see such series in the same way. What seems a clean association to the student arranging the species and working more or less consciously with a set of leading characters in mind, may seem an obvious misfit to another, seeing with an unbiased eye or with another set of characters in mind. In the same way, what may seem to one a distinctly separate series, may to the other appear a mere variation.

There is no doubt that in every collection of our Agrotids and especially in *Euxoa*, there are mis-identifications and mis-associations, and for much of this confusion I am at least partly responsible.

When collectors send me for determination one or two examples of a species captured by them, I am often unable to match the specimens exactly in my own material. If the specimens come from a region well collected over, I am apt to associate them with the species they most nearly resemble, as probably variations or slight local races. If the material comes from a region faunally distinct from anything nearly allied, I am apt to suspect a new species. Ordinarily I am more likely to assume a variety or a race than a new species, and hence the accumulation of additional material usually adds to the number of species recognizable in my collection. Much less error would occur if collectors would send a series rather than a specimen or two for determination.

In *Euxoa* structural characters so far have been of little assistance. The genitalia in the males are practically alike, or differ in matters of proportion merely, in a manner difficult to define and not convincing when figured. There is some difference in the antennal structure, but that is even more difficult of description in words, and the extent of possible variation has not been determined.

The advantage of a new eye over an old collection was very well illustrated when Mr. F. H. Wolley Dod, of Millarville, Alberta, looked over my material during the early days of 1910. He detected a number of erroneous associations which I had retained and, on the other hand, convinced me that some of my separations were not maintainable. I

had delayed action on some of my separations until Mr. Dod could have the chance to look them over, and now present descriptions of those forms that I still believe are worthy of specific separation. It will be noted that some of the species are based on very old specimens, which had been held as probable forms of others up to the present time.

Euxoa teplia n. sp.

Ashen gray, overlying a very pale luteous base. Head dusky. Collar inferiorly whitish, tip white, intervening area deep smoky brown. Primaries with all the usual *4-dentata* maculation very neatly defined. Costal area whitish, s. t. space whitish above. A yellowish streak in sub-median interspace, beyond claviform to the t. p. line or beyond. Basal line geminate, defining lines dark, included space whitish, marked only through the dusky area at base of sub-median interspace. T. a. line geminate, blackish, included space yellowish, with a well-marked outward angle in the sub-median interspace, and a longer acute tooth below vein 1. T. p. line moderately outcurved over cell, and very evenly, parallel with outer margin below it; geminate defining lines broken, strongly denticulate, best marked by the included pale shade. S. t. line white, only a little sinuate, moderately indented on veins 3 and 4 which are obviously rayed; preceded by a series of black, somewhat sagittate spots. Terminal area dusky except at apex. A series of black terminal lunules. A broad yellow line at the base of the gray fringes. Claviform moderate or small, black edged. Orbicular oblique, oblong, irregular, open to the costa, annulate in pale yellowish or gray, filled with luteous brown. Reniform moderate in size, kidney-shaped, black edged, with a pale annulus and a pale luteous filling. Secondaries in both sexes white with a slight smoky tinge. Beneath white, disk of primaries a little darker and with a series of dusky terminal lunules.

Expanse, 1.12 inches=28 mm.

Hab.—Colorado (Bruce); Stockton, Utah, IX, 14 (Spalding).

One male, one female, in good condition and almost exactly alike. It is rare that two specimens of different sexes are so nearly alike, even when taken at one time; but here the female is from Colorado, probably near Denver, taken at least a dozen years ago, while the female is from Utah, taken in 1904 or 1905. The resemblance is to *cinereopallida*, and with the female only at hand, I associated it with that species. With both sexes at hand, *teplia* stands out dis-

tinctly by its more sharply defined maculation, smaller size and lack of that peculiar rough, powdered appearance, characteristic of the larger form. The male antennæ have the segments well marked, but not drawn out into processes, and the bristle-tufting is distinct.

Euxoa vertesta n. sp.

Ground color a very pale luteous, powdered with gray and smoky brown; male on the whole a little darker than the female. Head rather uniformly powdered; palpi paler. Collar with a narrow and rather distinct dusky line inferiorly, and a more diffuse, broader and less distinct line across middle. Thoracic disc and patagia powdery, but without definite maculation. Primaries with all the normal maculation present; but powdery, diffuse and not contrasting or even well defined. Basal line geminate, very close to base, dark gray. T. a. line geminate, broken, a little irregular, but as a whole nearly upright to the internal vein (1), where it makes a long outcurve to inner margin. T. p. line geminate, very narrow, very even, well outcurved over the reniform, and a very little incurved below. A rather well defined median shade line crosses the anterior portion of median space, outcurved over the orbicular and reaching the internal margin with t. a. line. S. t. line of the pale ground, with a well marked "W" on veins 3 and 4, relieved against the darker terminal space and preceded by sagittate dusky marks, which indent the paler s. t. space, giving it a curiously dentate appearance. A series of black terminal lunules. Fringes lined with yellow and smoky. Claviform a small blackish loop with yellowish centre. Orbicular small, round, of the pale ground. Reniform upright, a little constricted, yellowish, with a gray central filling. Secondaries white, with a series of smoky terminal lunules. Beneath white, powdery along costa and at apex. A series of dusky terminal lunules and a small discal spot. The female that I associate with the male above described lacks the pale shading in the s. t. space, and the dentate appearance, although the course of the lines otherwise agrees. The claviform is long and dark filled; the orbicular is elongate ovate and dark filled; the reniform is larger and dark filled, though of the same general shape as in the male. The secondaries are whitish, tinged with smoky.

Expands, 1.20 inches=30 mm.

Hab.—Stockton, Utah, September 8, Mr. Spalding.

Only one male and one female, differing somewhat as already noted, but which I nevertheless consider as identical. The female has a little the appearance of a small *orthogonia*, but the male does not recall that species in the least. The antenna in the male is only slightly serrate and fasciculate. The tarsal joints in both sexes are rather conspicuously brown banded.

Euxoa flutea n. sp.

Ground color dull fusco-luteous. Collar with a diffuse whitish shade below a distinct black median transverse line; tip whitish. Disc gray, patagia with an obscure sub-margin. Primaries with all the maculation black, broken, incomplete. Costal area whitish to the t. p. line. Basal line marked only by a break in the black longitudinal mark that extends from base to t. a. line below the median vein. T. a. line single, marked by a black spot in cell, a distinct lunule in sub-median interspace, and an obscure lunule below vein 1. T. p. line single, a very little outcurved over cell, rigidly oblique below to the inner margin, consisting of a series of interspaceal blotches which are fairly well defined outwardly, but are inwardly diffuse. S. t. line defined by a few white scales, preceded by a series of black sagittate spots of almost equal size, and arranged in a rigidly oblique series. A lunulate black terminal line, followed by a yellow line at base of fringes. Claviform concolorous, outlined in black, extending half way or more across the median space, a pale streak extending outwardly beyond it through the t. p. line. Orbicular oblique, oval or somewhat elongate, touching the pale costal area, but hardly opening into it; distinctly black ringed, with a narrow white inside edging, centre concolorous. Reniform varying from crescent-shaped to oblong, upright, black ringed with a white inner edging, centre a little paler than ground. Median vein white; veins 3, 4, 6 and 7 rayed, but not prominently so. Secondaries uniformly smoky, yellowish, with white fringes. Beneath smoky, costal region paler and powdery.

Expands, 1.20 inches=30 mm.

Hab.—California, Sierra Nevada.

Two females in good condition. One of them has no definite locality, the other is No. 9926 of the Henry Edwards collection, and belongs to the American Museum of Natural History.

The species is undoubtedly mixed in collections with others of the *4-dentata* series. In fact, I have seen examples labelled *4-dentata* and *oblongistigma*. It differs from both by the blotch median lines, and by the remarkably even series of sagittate interspaceal marks that precede and define the s. t. line. In addition, the wings seem unusually short and narrow, in proportion to the very long abdomen, which exceeds the anal angle of secondaries by fully one-third its length.

Euxoa rabiata n. sp.

Ground color deep smoky brown, over dull, dark luteous; more or less powdered with whitish. Head concolorous. Collar with a black

line across middle, and that may or may not have some whitish margining scales above or below. Patagia somewhat powdered; a white line across base just behind collar. Disc of thorax somewhat white powdered. Primaries with the usual *4-dentata* maculation fairly well defined. The costa is concolorous; but the costal, sub-costal and median veins are white, and the inception of the median lines is marked by white dots on costa. Cell a little darker around the ordinary spots. Basal line geminate, black, included space yellowish, inwardly oblique below median vien. T. a. line geminate, black, included space luteous, with a small outward angulation in the sub-median interspace and a long outward bend below vein 1. T. p. line geminate, blackish, included space yellowish, slightly lunulate, as a whole almost strictly parallel with outer margin. S. t. line yellowish or whitish, broken, very even in course, indented on veins 3, 4, 6 and 7, which are rayed; the indentation on vein 6 being a little shorter than the rest. Terminal space uniformly dark except at apex. S. t. space a little paler beyond the t. p. line, darkened outwardly; a series of black, sagittate spots before the s. t. line. A series of small black terminal lunules and a yellowish line at the base of the broad fringes. Claviform narrow, extending half-way across the median space, black lined, concolorous, followed by a yellowish streak to the t. p. line. Orbicular round or nearly so, black ringed outside of a white annulus, centre yellowish. Reniform kidney-shaped, not sharply outlined, edged with black scales, with a whitish inward margin, centre yellowish with darker markings. Secondaries white, veins more or less dusky, a vague discal lunule and a narrow smoky outer border. Beneath; primaries smoky, powdery, with a darker extra-median line; secondaries white, powdery along costa, with a small black discal dot and a very narrow, incomplete, dusky outer line.

Expands, 1.12–1.25 inches=28–31 mm.

Hab.—Volga, South Dakota; Colorado; Calgary, Canada, VIII, 29.

Six males and two females in fair condition. One male is out of the Hulst collection from Colorado, one female from Calgary is from Mr. Dod, the others are out of Judge Truman's material. The specimens are all very much alike, and differ chiefly according to their age and state of preservation. The resemblance is to *rumatana*, also from South Dakota, from which it differs by the absence of fuscous and luteous shadings and the white secondaries, and to *niveilinea*, which is a larger, brighter colored species, and has the white line on patagia better defined, oblique, and not so near the collar.

The antennæ of male have the sides of the joints slightly drawn out, and the bristle-tufting well marked.

Euxoa brevistriga n. sp.

Ashen gray with a tendency to reddish, more or less powdery. Head black and white mottled, without distinct markings. Collar with a series of alternate blackish and paler lines, the dark lines broadening upward, the collar white tipped. Patagia dusky, with a darker sub-marginal shade and paler edge. Disc mottled gray and whitish. Primaries with a dusky shading over costal region, terminal area all smoky brown. Median lines barely marked on costal region only, else obsolete. Basal line traceable, geminate. S. t. line marked by the sharp inner edge of the dusky terminal space; decidedly toothed on veins 3 and 4, and a little indented on veins 6 and 7. A series of black terminal lunules, followed by a pale yellowish line at base of fringes. On the sub-costal vein at base there is a short blackish streak which is edged by whitish. The veins are marked by blackish scales, and on veins 3 and 4 there are also pale shades giving a rayed appearance, characteristic of the *4-dentata* series. Claviform faintly and incompletely outlined by darker brown scales. Orbicular oval, oblique, moderate in size, of the pale ground, narrowly dark edged. Reniform narrow, almost crescent-shaped, of the pale ground color, outwardly with a reddish shading. Secondaries white, veins a little yellowish, a narrow terminal line smoky. Beneath white, blackish powdered along the costal margin and at apical third of primaries, and along costal margin only of secondaries; all wings with a small blackish discal lunule and a lunulate terminal line.

Expanse, 1.35–1.50 inches=34–37 mm.

Hab.—Colorado, probably near Denver.

I have two males, in good condition, collected years ago by Mr. David Bruce. The specimens have been tentatively associated with *brevipennis*, and agree with that species in the robust thorax and comparatively short abdomen. They differ in the almost complete obsolescence of the median lines and the uniformly sharply defined dusky terminal space. The antennæ have the joints laterally produced or very shortly pectinated, each process with a short stout bristle which is set with shorter hair. A characteristic feature is the short dark dash at base of subcostal, set in a pale shading.

Euxoa angulirena n. sp.

Ground color dull smoky fuscous. Head with a narrow paler line, below antennæ, Collar with a distinct black median line and a white tip. Patagia darker, tending to blackish, edged with gray. Disc of

thorax grayish. Primaries with ornamentation well defined. Costal area paler to the reniform ; sub-costal whitish to the orbicular. Basal line marked by geminate blackish marks on costa and in the sub-median interspace ; a narrow blackish line connecting the lower spots with the t. a. line. T. a. line geminate, blackish, defined only in the sub-median interspace. T. p. line marked by geminate spots on costa above reniform, outcurved closely over this spot, then rather evenly oblique, single, broken, to the inner margin. S. t. line pale, powdery, irregular, broken, emphasized by the series of preceding black spots, some of which are sagittate ; outwardly a little indented on veins 3 and 4, and a little less on veins 6 and 7. A narrow, black, slightly lunate terminal line, followed by a yellow line at base of fringes. Claviform a little darker than ground, black edged, extending across the median space and touching the t. p. line. Cell around and between the ordinary spots a little darker. Orbicular oblong, open to the costa, drawn to an angle posteriorly, paler than ground, a whitish line within the black defining edge. Reniform narrow, kidney-shaped, the inner edge drawn out into a little tooth or angle toward the outward angle of orbicular, narrowly black-ringed, within this a somewhat diffuse whitish shade ; centre a little paler than ground, with a rusty yellowish outer line. Veins 3, 4, 6 and 7 are dark marked and a little rayed in appearance. Secondaries smoky, veins a little darker, fringes white. Beneath white ; primaries smoky on disk, else coarsely powdered with blackish ; veins dusky and a dusky discal lunule ; secondaries powdery along costa, with an extra-median powdery line and a small discal spot.

Expands, 1.50 inches=37 mm.

Hab.—Colorado (Bruce).

A single good female specimen from the Bruce collection. It is another one of those forms easily confused with *brevipennis*, but not so robust, and with proportionately smaller body and more ample wings. The form of the ordinary spots is characteristic and unlike that of any other species known to me.

Euxoa poncha n. sp.

Ground color a very pale whitish yellow, tending to creamy. Head with a blackish transverse line inferiorly, palpi dusky at sides. Head and thorax otherwise without maculation. Primaries with all the maculation broken and marked by dusky powderings, more complete in the female than in the male. Basal line geminate, marked on costa and below median vein only. T. a. line geminate, the parts about equally developed, upright as a whole, slightly outcurved in the interspaces. T. p. line geminate, parallel with outer margin, almost rigid;

inner line a little denticulate on the veins, outer vague and diffuse, even. S. t. line concolorous, a little irregular, marked by a narrow blackish preceding shade which tends to become broken and is only a little better marked on costa. A series of small black terminal lunules. Median line fairly obvious, narrow, extending from costa obliquely through the lower half of reniform so as to darken the outer border and lower part of spot, thence close to and parallel with t. p. line to the inner margin. Orbicular concolorous, vaguely defined by a slightly paler ring. Reniform kidney-shaped moderate in size, vaguely defined by a somewhat paler ring, except where the median shade darkens and emphasizes it. Secondaries snow-white in both sexes ; in the male with a narrow smoky terminal line, in the female with a vague, diffuse, narrow sub-marginal band. Beneath white, almost immaculate, a little dusky powdering along costa of secondaries, a tendency to a discal spot and an extra-median line in primaries.

Expands, 1.60–1.65 inches=40–41 mm.

Hab.—Denver, Ft. Collins, Poncha Springs, Colorado, in July.

Two males and one female in good condition and very much alike. These also are old specimens, received from Mr. David Bruce and Prof, C. P. Gillette many years ago, and they have, until recently, been associated with *E. medialis* in my collection. That species, however, has the antennæ of the male very slightly serrate and fasciculate, while in *poncha* the lateral processes are long and in the nature of short branches or pectinations. In general the maculation is very like that of *truva ;* but the ground lacks all trace of reddish or carneous gray and, in the female, the secondaries are white, as are those of the male. There are other differences in the course of the lines, and especially the median shade that may be noted by comparing the descriptions ; but the ground color and sexual differences will serve most readily for that purpose.

Euxoa truva n. sp.

Ground color reddish-gray, with more or less black powdering. Front with a narrow black transverse line below the middle, sides of palpi dusky. Collar with a reddish line below the tip and a single line near the margin of patagia. Primaries with all the lines present, but much relieved and more or less fragmentary. Basal line geminate, blackish, broken, outwardly bent on the median vein. T. a. line geminate, the component parts about equally developed, tending to

obsolescence, a little outcurved as a whole and outcurved between the veins. T. p. line geminate, rather abruptly bent outward below costa and then very evenly oblique to the inner margin. The inner line tends to be crenulated, only a little darker than ground, the outer tends to become broader, even, and almost like a band with rather diffuse edges. S. t. line concolorous, a little irregular, marked by the blackish powdering in the terminal space, and a variably obvious preceding shade which forms a more definite mark on the costa. Median shade forms the most obvious feature of the wing ; it is rather narrow, well defined, but without sharp edges, crosses outwardly from costa between ordinary spots to the lower edge of the reniform, and then bends inwardly, parallel with and rather close to the t. p. line to the inner margin. Claviform not traceable. Orbicular round or nearly so, moderate in size, feebly defined by a slightly paler annulus, centrally with dark powderings. Reniform kidney-shaped, of good size, defined by a slightly paler ring, inferiorly dusky. There is a series of very small black terminal lunules. Secondaries pure white in the male, uniformly smoky, with white fringes in the female. Beneath white in the male, with a dusky lunule on primaries ; iridescent smoky, without marks in the female.

Expands, 1.30–1.60 inches=33–40 mm.

Hab.—Denver and Poncha Springs, Colorado; July and September.

Two males and one female in good condition. Specimens received from Mr. Bruce many years ago and placed with *caenis* Grt., which the species in a general way resembles. It is more powdery than that species however, and the course of the lines is different ; its resemblance is really more nearly to *medialis*, and I have no doubt that specimens of this form are in collection as *caenis* and as *medialis*. It does not seem to be common, judging by the small number that I have had.

Euxoa lenola n. sp.

Ground color a rather dull leather brown, more or less clouded with smoky. Palpi chocolate brown at sides. Collar dusky at extreme base and, in well preserved specimens, a narrow gray line at tip. Thoracic vestiture with tuftings gray tipped ; else concolorous. Primaries at first blush seem uniformly dull brown, but on careful examination all the normal maculation can be traced. The lines are not at all relieved, however, and scarcely darker than ground. The t. a. is upright or nearly so, with slight outcurve in the interspaces. T. p. nearly parallel with outer margin, slightly crenulate. S. t. a little irregular. Claviform not traceable in any specimen. Orbicular round, moderate in size, with a faintly paler annulus ; centre a trifle darker. Reniform kidney-shaped, a little darker, more or less defined by yel-

lowish scales. Secondaries white with a slight yellowish tinge in the male, pale yellowish smoky in the female. Beneath whitish, with a rather uniform sparse dark powdering.

Expand, 1.52–1.72 inches=38–43 mm.

Hab.—Glenwood Springs, Colorado, in August (Barnes); Ft. Collins, Colorado (Gillette); Hot Springs, New Mexico, 7000 feet (Hulst).

Two males and three females in good condition and all very much alike except in size. The species has been confused with *caenis* and *gagates*, but more generally with the former. It is duller and more powdery than either, the maculation is barely traceable, there is hardly a trace of carneous gray, and the primaries are a little more pointed.

The joints of the male antennæ are laterally produced into very short branches, at the tip of which is a bristly process set with finer, stiff hair.

Euxoa biformata n. sp.

Ground color rusty red-brown with a more or less marked smoky suffusion. Head and thorax concolorous, palpi chocolate brown at the sides. Primaries in the male with all the transverse maculation practically lost in the smoky suffusion except for darker costal marks. In the female all the maculation is distinctly traceable though not well marked. Basal line marked by geminate spots on costa, else obsolete. T. a. line geminate on costa, thence only the outer part traceable; nearly upright to internal vein, below which it makes a long outcurve to margin. T. p. line geminate, very even, almost rigidly parallel with outer margin; inner portion very narrow, smoky, continuous; outer a series of short blackish venular marks. A vague, smoky, diffuse, irregular median shade through the outer portion of median space. S. t. line irregular, marked only by the slightly darker terminal space. In both sexes there is a series of very small dusky terminal dots. In both sexes the claviform is wanting, and the ordinary spots are obscure, barely traced out by a scant powdering of yellow scales. Orbicular moderate in size, round. Reniform large, kidney-shaped. Secondaries smoky in both sexes, a little darker in the female, veins smoky throughout. Beneath white, powdery along costal region and toward apex. Legs dusky, tibiæ rather conspicuously pale-marked at tip.

Expends, 1.55–1.80 inches=39–45 mm.

Hab.—Sierra Nevada, California.

One male, the smaller, and one female, both in excellent condition. The specimens contain no data as to their point

of origin or date; but the labels are identical, and despite the difference in appearance obviously belong together. The resemblance is to *mimalonis*, but the species is much more robust and the vestiture is much denser and heavier.

The male antennæ have small, lateral, conical processes with tufts of short bristly hair at tip.

Euxoa cervinea n. sp.

Ground color pale ashen-gray with a vinous red tinge, more or less powdery. Head and thorax concolorous; collar with a vague carneous median line, else no maculation. Primaries with the normal maculation well defined though never conspicuous, traceable in most instances and almost completely obsolete in occasional specimens. Basal line geminate, powdery, blackish, rarely present. T. a. line geminate, inner element rarely present, so that usually it appears simple; outwardly oblique, a little outcurved in the interspaces to vein 1, and below that with a long outcurve. T. p. line single, crenulate, evenly outcurved over cell, a very little incurved below, forming the most persistent feature of the transverse maculation. S. t. line concolorous, almost evenly parallel with outer margin, defined only by differences in shading between terminal and s. t. spaces, and these shadings are not alike in any two examples, the line varies equally in distinctness of definition. A narrow, broken blackish terminal line. Claviform small, concolorous, very incompletely defined by dusky scales. Orbicular concolorous, round or oval, varying in size, incompletely defined, the cell between it and reniform usually darker, reddish or smoky. Reniform large, extending well below median vein, inferiorly dusky, a little constricted, incompletely defined. A dusky median shade line extends obliquely from costa between the ordinary spots; invades the lower part of reniform and then runs parallel with and rather close to t. p. line to the inner margin. Secondaries dull smoky gray in both sexes, with a more or less obvious discal lunule and a dusky submarginal line. Beneath grayish-white, powdery, with a well-marked extra-median line and discal spot on all wings.

Expands, 1.25–1.35 inches=31–34 mm.

Hab.—Bozeman, Montana, Aug. 7–31; Vancouver, B. C., July 16; Banff, B. C., Aug. 10; Calgary, Alta., Aug. 30.

Five males, one female, in good to fair condition. This is a species which I had confused with the Californian *rena*, and which is probably the species referred to under that name in Mr. Dod's Calgary list. In specimens with the transverse maculation lost and the space between the ordinary spots reddish, the resemblance to *rena* is striking; but with a better series at hand the resemblance tends to *dissona*

in specimens with single median lines and reddish shadings. Finally, with fully marked individuals without much reddish, a resemblance to *munis* becomes obvious, and that is the real relationship of the species. *Rena* is really not a near ally at all, and is rather of the *tessellata* series. *Dissona*, *cervinea* and *munis* are allies, and will require further study from larger material to bring out fully the differences between them.

Mr. Dod was good enough to call my attention to the fact that the Calgary species was not identical with the Californian. I have only one Calgary example before me, and that looks as though there might be yet another species involved.

Euxoa indensa n. sp.

Ground color a bright mouse-gray, more or less tinged with reddish or smoky. Head and thorax without definite maculation; head usually gray powdered; thorax reddish or brown tinged, as dark or darker than any other shade on the insect, the scales slightly gray-tipped. Primaries with all the normal maculation distinctly and even brilliantly defined. The ground color is a clean gray, the cell intensely black before and between the ordinary spots and the outer third of median space is reddish, rusty or smoky. Basal line geminate, black, cleanly defined. T. a. line geminate, black from costa to median vein, blackish or brown below that; outwardly oblique and a little outcurved between veins. T. p. line geminate, black on costa, abruptly bent over cell, then even, parallel with outer margin; inner part lunulate, well marked, outer portion even, powdery, tending to become lost. S. t. line of the ground color, only a little irregular, more or less defined by the darker terminal space and by a variably developed preceding dusky shade. A very narrow, lunate, black terminal line. Fringes carneous, long and dense. Claviform small, barely indicated. Orbicular large, gray, not closed above or below, clearly defined by the black filling of median space. Reniform large, broad, kidney-shaped, with a dark central crescent and a more or less obvious carneous shading. Secondaries soiled yellowish white, with a smoky outer border and veins in the male; smoky, with whitish fringes in the female. Beneath whitish, powdery, both wings with more or less complete extra-median line and a dark discal lunule; primaries more or less dusky on disc.

Expands, 1.25–1.35 inches=31–34 mm.

Hab.—Volga, South Dakota (Truman); Cartwright, Manitoba, VIII, 19 (Heath); Brandon, Manitoba, VII, 14 (Hanham).

One male and three females, all in good condition. The

species resembles *verticalis* Grt., in general appearance and type of maculation; but is narrower winged, the primaries more obtuse and the maculation more complete and clearly defined. A somewhat characteristic feature is the darkened outer portion of the median space, which in *verticalis* is concolorous. In the specimens before me the single male has more red than any female, while the females differ in the amount of shading in the s. t. and terminal spaces and the amount of contrast between the lines and shades; but always the specimens are very neatly and cleanly marked.

The male antennæ are serrate and fasciculate, the lateral processes being well marked and conical, but not forming true branches.

Fishia instruta n. sp.

Pale ashen-gray, with a bluish tint, very even; markings narrowly and rather well defined, but not contrasting. Collar with a narrow, clear-cut median black line. Patagia with an indicated sub-marginal line. Primaries with a narrow black basal streak which does not reach the t. a. line. T. a. line single, narrow, black, preceded by white scales, strongly dentate in the interspaces, the largest tooth in the sub-median interspace, and to it is attached the concolorous, black-edged claviform, which extends across the median space and reaches the incurve of the t. p. line. T. p. line black or blackish, less defined and more diffuse toward costa, outwardly dentate on the veins, incurved in the sub-median interspace, where it is most distinct and preceded by white scales. S. t. line marked by a series of three to five irregularly placed short, black, interspaceal dashes, some before and some beyond a series of obscure, whitish dots. No terminal line. Fringes concolorous, cut with yellowish at the ends of the veins. Orbicular large, oblique, oval, narrowly black ringed, concolorous or very slightly paler. Reniform large, kidney-shaped, inwardly black-edged, with white or whitish scales forming an inner, more or less defined ring; it may be concolorous or a little paler. Secondaries white, powdery, with a broken punctiform dusky extra-median line, a vague discal spot and a well-marked blackish, lunulate terminal line. Beneath whitish, rather evenly powdery, with a well-marked small discal spot on all wings and a vaguely marked extra-median line.

Expands, 1.50–1.58 inches=27–29 mm.

Hab.—De Clair, Manitoba, Sept. 3–15.

Four males, in good condition, collector unknown. The species resembles *yosemite* Grt., in the uniform coloration of primaries; but these are gray, without trace of brown, and the secondaries are white, without trace of fuscous. *Yose-*

mite male and female were represented in the same collection, and were easily separated out. Maculation almost exactly like *yosemite*, but not so well marked. The possibility of a well marked variety is not excluded.

Mamestra chunka n. sp.

Body and primaries smoky fuscous. Head with obscure, dark, frontal lines. Collar with two narrow blackish transverse lines, one above middle and one just below tip. Patagia with black sub-margin. Primaries with all the maculation well defined but not contrasting. Basal line broken, black, geminate, outer portion obscure, included space concolorous. T. a. line geminate, inner portion brown, rather even, outer black, a little outcurved in the interspaces, tending to become broken on the veins. Resting on the inner margin, and against the lower portion of the t. a. line there is a dark smoky blotch in the basal space that is inferiorly marked by a short black streak. T. p. line rather abruptly bent over cell, almost evenly oblique below this, geminate, inner line black, slender, a little lunulate, outer line brown, slender, even, very close to inner so as to leave a very narrow included space. S. t. line pale, yellowish, outwardly dentate to the margins on veins 3 and 4, obscured toward apex by the pale apical shade. A series of black terminal lunules. Fringes cut with yellowish opposite veins. The s. t. space is variably shaded with gray, and gets a somewhat strigate appearance from the darker veins, emphasized by the long outward dents of the s. t. line and by a series of two large and several small black sagittate preceding spots. Claviform rather large, pointed, extending nearly across the median space, often dark filled. Orbicular narrowly elongate, small, with a pale outline. Reniform large, kidney-shaped, with the lower lobe extending outwardly, more or less distinctly black margined, and usually dusky filled at least inferiorly. Secondaries pale at base, darkening to a broad dark outer margin ; the veins smoky, and a dark discal lunule obvious. Beneath, all wings with a blackish extra-median line and discal lunules.

Expands, 1.35–1.32 inches=31–32 mm.

Hab.—Aweme, Manitoba, V, 13, 22 ; V, 20, Mr. Criddle.

Three good males, one of them belonging to Mr. Dod. The antennæ have the joints distinctly marked, with tufts of short soft ciliations laterally. The general habitus is like *crotchii*, but it is even more robust, shorter winged and heavier bodied, with a clean-cut maculation. There is, indeed, a tendency toward *farnhami*, and it is not improbable that some of the better marked forms have been placed under that name.

Mamestra ortruda n. sp.

Ground color a rather even pinkish luteous, on which the maculation of primaries is prominently and contrastingly written. Front protuberent, convex, concolorous. Collar with an obscure dark transverse line above the middle. Disc of thorax with rather well defined anterior and posterior tufts; patagia a little powdered, sometimes with an obscure, dusky sub-margin. Abdomen rusty yellowish. Primaries with all the markings well-written, essentially like those of *albifusa*. Basal line geminate, black, interrupted on median vein. T. a. line geminate, black, outer portion best marked and defined, inner portion preceded by a diffuse blackish shade varying in extent in the specimens; in course rather evenly and not greatly outcurved. T. p. line geminate, rather obscure, inner portion lunuate, smoky, outer portion more even and less obvious—tending, indeed, to become lost; in course abruptly bent over cell and then very even and almost direct to inner margin. S. t. line paler than ground color, irregular, forming outward dents that reach the outer margin on veins 3 and 4, preceded by conspicuous black sagittate marks in the middle of its course. Terminal space a little darker than the ground. A series of black terminal lunules. A slender yellow line at base of the dusky fringes which are cut with yellow opposite the veins. Claviform short, broad, blackish-filled, conspicuous. Orbicular rather small, a little ovate, oblique, pale-ringed, concolorous. Reniform very large, kidney-shaped, or a little constricted, narrowly outlined in black, with an incomplete inner pale ring, smoky filled, with or without a pale lunule. Secondaries yellowish, veins blackish, a broad blackish outer border which is inwardly diffuse; a smoky discal lunule; a dusky more or less obvious lunate terminal line. Beneath yellowish, powdery, with a broad blackish subterminal band which is sharply limited outward by the paler terminal area; primaries with a large dark discal lunule, secondaries with a small dark discal spot.

Expands, 1.32–1.48 inches=33–37 mm.

Hab.—Denver and Glenwood Springs, Colorado, April, June, July and August.

Five males and three females in fair to good condition. and all very much alike in general appearance. This species was first received by me many years ago from Mr. David Bruce, and has since then been sent in by Dr. Barnes, to whom five of the examples under consideration belong. The species is nearest to *obesula* in general appearance and size, with a very decided leaning toward *farnhami* in color and maculation, which latter is, nevertheless, on the whole more like that of *albifusa* than of any other species.

STUDIES IN NORTH AMERICAN DIPTEROLOGY: PIPUNCULIDÆ.

BY E. T. CRESSON, JR.

Plates V–IX.

This paper is the result of about two years interrupted study of this little known family of Diptera. Unknown to either of us, Mr. Nathan Banks had also been doing some work with the genus *Pipunculus;* but upon discovering that I had also been working on the same group with much more material at hand, he kindly turned over to me his collection and descriptions of some forms he considered new. These latter I give in this paper as "Banks, n. sp." accompanied by my own observations upon the types. The collection before me for study composes, besides that already at the Academy of Natural Sciences of Philadelphia, the material loaned by Mr. C. W. Johnson of the Boston Society of Natural History, which, upon addition of that of Mr. Banks, makes a sum total of 216 specimens, of which I find 31 known species and 31 which I consider new.

My first attempt in the study of this group of insects was in endeavoring to determine a few specimens in the collection here in Philadelphia. I found most of them undescribed, but hesitated to describe them as new upon such small amount of material at hand. Mr. Johnson then offered me the loan of the undetermined material in his own collection and in that of the Boston Society of Natural History, and so my humble attempt has emerged into an undertaking far beyond my expectations. I regret the inability of giving a more exhaustive treatise on the subject, but the pressure of work on another paper I had already begun makes this impossible. Still it is hoped that this contribution will be an incentive to some other student, who can give the subject a more monographic treatment; for by special collecting, breeding and the borrowing of all the available material, one should

be able to work up a very valuable monograph of this obscure, but well-defined family.

It seems that there are either many good species, or else the individual variation is very great, for only a small number of the forms are represented by more than one or two specimens; so it is with some hesitancy that I am considering as new many of the forms herein described, especially where only one sex is represented.

I regret that this well marked family is in danger of losing its old name, in fact has lost it in a recent catalogue of Diptera.* The recent discovery of an early paper by Meigen, published in 1800,† antedating other publications from which many well known genera of Diptera date, throws a cloud over Dipterological nomenclature. The absence of specified generic types in that paper, together with the short generic descriptions, makes it of doubtful value in the opinion of some students. It was only with the help of Meigen's later work, published in Illiger's Magazine in 1803, that most of the genera could be placed at all, still leaving some very doubtful. In looking over the situation, with the help of the original literature, regarding the genus affecting this family, questions arose which threw so much doubt over the whole affair, that I have concluded to disregard the paper entirely. I will have to go into a short analysis of the situation in order to bring out these queries as they appeal to me.

Dr. F. Hendel, who first brought this paper to the attention of the scientific world, has published an extended article on it,‡ in which he quotes the generic descriptions and gives his ideas of their application. On page 59 he gives *Dorilas* Meigen, as corresponding to the genera *Microcera* Meig., and *Pipunculus* Latr., thus making these two synonyms of *Dorilas*, which as the type genus, would change the name of this family to Dorilaidæ. Meigen characterizes his genus *Dorilas* as: "Antennes a deux articulations: la seconde

* Catalogus Dipterorum by C. Kertesz, Vol. VII, 1910.

† Nouvelle Classification des Mouches a Deux Ailes (Diptera L.), Paris.

‡ Verh. k. k. Z. B. Gesell. in Wien, LVIII, 43–69, 1908.

inclinée, garnie a la base d'un poil simple. Tete hémisphérique. Ailes croisées, obtuses. 1 espèce." Upon referring to his later paper* it is seen that the descriptions of the genus *Microcera* is very similar to that of *Dorilas*, still he names no type. Some years later, in 1824, he states† that his genus *Microcera* is antedated by Latreille's *Pipunculus*. This fixes *Microcera*, throwing it into synonomy under *Pipunculus;* but it is only upon the similarity existing between the descriptions of *Dorilas* and *Microcera* that leads one to consider them synonymous.

The only species of this family known at the time of Meigen's early paper was *Musca cephalotes* Bosc.,‡ which seems to be a true *Pipunculus*, and was used later by Latrielle§ as the type of his genus *Pipunculus*‖ under the name of *Pipunculus campestris* Latr. It may be supposed that Meigen had this species before him at the time of his writing the first paper; but his description of *Dorilas* seems to apply more truly to a species which would now go under *Verrallia;* the head of that genus being truly hemispherical, while that of *Pipunculus* is almost spherical. Later on Meigen said that Fabricius had shown him a specimen of the genus *Pipunculus* in 1804, but he, Meigen, makes no mention of possessing one. So we are not certain that Meigen did erect his genus *Dorilas* upon a true *Pipunculus*.

As to whether *Dorilas* can be admitted under the rules of nomenclature has been discussed by Prof. J. M. Aldrich¶ and Mr. D. W. Coquillett,** from which it seems to be a question that can only be settled by the Committee on Zoological Nomenclature. So it is seen there is no certainty, but much guess work, which is, to my mind, sufficient cause for disregarding, for the present, the use of *Dorilas* Meigen, as a valid genus. Kertesz, in his Catalogus

* Illiger's Magazine, II, 273, 1803.
† Syst. Beschr. Eur. Zweifl. Ins., IV, 19.
‡ Journ. d'hist. Nat., Paris, II, 55, Pl. 28, Figs. 5–7, 1792.
§ Hist. Nat. Crus. et Ins., IV, 392, 1805.
‖ *Loc. cit.*, III, 463, 1805.
¶ Can. Ent., XL, 370 and 432, 1908.
** *Loc. cit.*, 457.

Dipterorum, amends the name to *Dorylas*. With these few words of analysis and explanation I will let the matter drop as irrevelent to the purpose of this paper.

For the proper description of the species in this paper, names are used which may be unfamiliar to many students, and to some parts of the genitalia I have given arbitrary, or provisional, names for convenience, as I have no time to go into anatomy and terminology. All these names I will here explain.

The *squamæ*, in this family, are mere ciliate ridges, being rudiments of a pair of membraneous scales situated above the halteres and back of the root of the wings, perhaps more often known as *Tegulæ*, *Calyptræ* or *Alulæ*. The *ventral margins* of the abdomen are the ventral portion of the dorsal plates; the *lateral angles* of the segments I have designated as the lateral portion of the apical margin just where the dorsal plates turn down; these angles are often pollenose, being the dorsal attenuations of the pollen on the ventral margins. The examination of the genital apparatus shows a similarity in structure but great diversity in form. It is here that much can be done in the study of this family. I have not given these organs as much importance as they probably should have; but it appears to me that in some species there is much variation, or, on the other hand, the forms I have included under one may be distinct.

The *hypopygium* of the male seems to be composed of five separate, at least externally, chitenous sections or lobes, of which, in some species of *Pipunculus*, only one, the *terminal lobe*, is visible; this is sometimes very irregularly developed, being strongly compressed laterally, usually to the right of the median line of the abdomen, in which case the hypopygium is said to be *assymetrical*. This lobe is generally, but not always, furnished, usually to the right of, or at its apex, with an indentation or *cleft*, sometimes known as the *rima*, and which in the genus *Verrallia* (Fig. 44) completely divides this lobe dorso-ventrally into two separate parts, or is, in a species of *Pipunculus* so widely developed as to occupy nearly the entire lobe, or at other times is only indicated by

an opake spot. This cleft is sometimes provided with a filiform appendage (Fig. 47) which often coaleses with the bottom of the cleft in form of a *vertical keel* (Fig. 69). To the left of the terminal lobe is the *intermediate lobe* (Fig. 49) which is often invisible, being withdrawn into the fifth abdominal segment; it is never very much developed, and is only distinguished from the terminal lobe by the vertical incisure in form of a finely impressed line, which is one of the "two dorso-ventral clefts . . . to the left of the median line" mentioned by Dr. Hough in his description of *P. atlanticus*. To the extreme base of the intermediate lobe, often ventral in position, is the *lateral lobe* (Fig. 49), which is seldom visible, and is similar to the intermediate lobe, being separated from it by an impressed line. At the extreme right of the terminal lobe, and mostly ventral in position, is the *ventral lobe* (Fig. 61), which at its base is probably the copulating apparatus; this lobe is most conspicuously developed in *Pipunculus atlanticus*, and can at once be distinguished, especially when, as it often is, of a translucent yellow color. Above, and at the extreme base of the terminal lobe, is the *basal lobe* (Fig. 44), which is most strongly developed in *Verrallia*, but indications of it can be seen in some specimens of *Pipunculus* beneath the apical margin of the fifth segment. The genitalia of the female is much more simplified, being composed only of the more or less globose *base*, and the aculeate *ovipositor*, at the base of which, beneath, is an opening, revealed by a tuft of short hairs (Fig. 86). The presence or absence of the cleft in the terminal lobe of the males is of much importance systematically, but it may be quite variable in form in the same species, while in *Pipunculus atlanticus* it may be quite distinct or hardly discernable; some times the entire hypopygium is extended so as to reveal the yellowish membrane between the different lobes.

The *femoral spines* are the series of small black teeth or spines on the flexor or under surface of the femora, being more developed on the apical portion; these spines are quite distinct and in two rows, or, on the other hand, are hardly distinguished under high magnification.

The *stigma* is that portion of the costal cell between the apices of the auxiliary and first veins, and is often known as the third costal section; it is sometimes tinged with brown, especially in certain groups. The *fourth section* just follows, being that portion of the costa between the apices of the first and second veins. The *third section* of the fourth vein is that portion between the anterior and posterior cross-veins.

For a satisfactory examination of these insects, especially of the bristles, which are generally more like hairs than bristles, a compound microscope is necessary, but not essential for determining most of the species as characterized in the synopsis, except perhaps those of the *subvirescens* group, which will give the most trouble in this respect.

I have followed the recommendations of the Entomological Congress in designating a single specimen as the type of each species, but have called the remainder of the series paratypes, as I do not favor the use of the much misused term "cotype" when there is a type designated. The descriptions are, of course, based upon the series which is composed of the type and its paratypes. With the habitat of each species I have given, in parentheses, after each locality, the number and sex of specimens examined, followed by the name of the collector and the collection possessing such specimens. Where the name of the collector is not given, the same is unknown, or is the owner of the collection. I wish here to acknowledge my indebtedness to Mr. Banks for his generosity in turning over his collection for my use, these are designated "coll. Banks;" also to Mr. Johnson who kindly loaned me the extensive New England material in the collection of the Boston Society of Natural History ("*B. S. N. H.*") and from his own collection, "coll. Johnson." Those designated "*A. N. S.*" are from the collection at the Academy of Natural Sciences of Philadelphia.

While on the subject it was thought that a synopsis, as well as a bibliography and catalogue of the North American species, would be useful to have under one cover, and would be helpful to those students wishing to determine their own material, and who have not access to the literature required. The completeness of this synopsis is greatly hampered on account of the limited amount of material at hand represent-

ing the species heretofore described; but will serve, at least, as a fairly good guide to the known species of this family inhabiting North America. In the compilation of this synopsis only those characters which seem the least variable and most conspicuous are used. No attempt is made towards a serious classification.

The flies of this family are small, nearly bare, except *Verrallia*, black, with at most only the humeri, halteres, the sides of the abdomen rarely, and the legs, yellow; more or less variegated in appearance by the presence of silvery pubescence on the front and face, and gray or brown pollinose coating on the bodies and legs. The surfaces are generally shining, being more or less obscured by the density of the pollen, so that rubbed specimens are more shining than normal; the abdomen is sometimes semi-shining, as it were, caused by the minute granulation or rugulosity of the surface. The color of the humeri is a very good character, but close examination is necessary on account of their being covered by the swollen occiput, or, rarely, the color is difficult to distinguish between a brown and yellow.

The head is large, unusually so, larger than the thorax, especially in the genus *Pipunculus;* composed mostly of the compound eyes, leaving the narrow face and front; the latter, in the male reduced to a small triangle by the contiguous, rarely narrowly separated, eyes. Antennæ situated about on line with the middle of the head, composed of a small second joint and an elongate, pendant, third, which is more or less acute or acuminate apically, bearing near its base above, a simple, naked, hair-like arista, which is more or less thickened basally. The mouth parts are generally retracted, but sometimes the small, clavate palpi are visible. The thorax is smaller than the head, quadrate, with the mesonotum and scutellum rarely with regularly arranged series of fine bristles; humeri well developed, sometimes appearing like scales. Abdomen ovate and flattened, or narrow and subcylindrical, consisting of five segments in the male and six in the female. Legs generally moderately slender, with apical portion of the femora and tibiæ more or less thickened, without distinct bristles, except the femoral spines,

and the series of short minute appressed thorn-like bristles on the tibiæ, which are more distinct when the latter are yellow; the tarsi have long fine hairs at the apices of the joints. Claws generally very long and curved at tips, with large spatulate pulvilli and hair-like empodium. Wings hyaline, or, evenly gray or brownish, not maculate; venation varying as shown in the figures under the various species.

TABLE OF GENERA.

1. Discal cell incomplete, the fourth vein beyond the anterior cross-vein being rudimentary and the posterior cross-vein wanting. **Chalarus.**

   Discal cell complete.....2.

2. Head nearly spherical; occiput with turgid margin, being generally widely visible behind the eyes; ocellar bristles absent..3.

   Head truly hemispherical; occiput not widely visible, *i. e.*, the head being closely applied to the thorax; ocellar and scutellar bristles distinct; pilose species.....**Verrallia.**

3. Scutellar bristles well developed; third antennal joint reniform. **Nephrocerus.**

   Scutellum and mesonotum without distinct bristles; third antennal joint acute or acuminate.....**Pipunculus.**

CHALARUS Walker.

This genus is at once distinguished by its venation. Only one, the European, species is known here,. Aldrich, in his catalogue, mentions that we have an undescribed species; and there is also another recorded from the White Mountains, New Hampshire, by Coquillett (1896 Slosson 263).

C. spurius Fallen (Figs. 1, 43, 152), has been reported from New Hampshire (1902 Slosson 7), and from New Jersey (1899 Smith 666), and before me are a number of specimens from Norwich, Vt,. Mt. Ascutney, Vt., Rockport, Mass., Auburndale, Mass. (*Johnson, B. S. N. H.*); and Swarthmore, Pa. (*Cresson, A. N. S.*). Taken June to August.

VERRALLIA Mik.

Allied to *Pipunculus*, but more distinctly pilose, with a pair of prominent ocellar bristles; the head is closely applied to the thorax, so that the occiput is not puffed out behind the eyes as it is in that genus; the third antennal

joint rounded apically, with no sign of an angle. We have only a species described from the State of Washington, *V. opaca* Will., and the following, which appears to be an European representative.

V. pilosa Zetterstedt.

♂. Front and face silvery; vertex opake, black, with 2 long black, ocellar bristles; occiput opake, black. Antennæ (Fig. 2) with second joint black, bearing long black bristles above and longer yellowish ones below which extend beyond apex ot third; third shorter than second, yellow to black at base, more or less silvery. Thorax opake black, or, in places somewhat shining; more or less brownish pruinose with black pile and long bristles; the latter can be distinguished among the pile as follows: 2 notopleurals, 1 supraalar, 2 postalars, 1 prescutellar, and 1 or 2 humerals. Scutellum concolorous, with black pile and 4 marginal bristles. Pleuræ and metanotum hardly grayish tinged; pteropleura pilose; humeri and halteres black; squamæ yellowish. Abdomen opake, black, with only the lateral angles of segments 1–4 grayish; fifth equalling fourth; second the longest; clothed with long blackish pile, especially lateral margins, but longest on first where it forms quite a distinct lateral tuft. Hypopygium (Figs. 44–45) as long as second segment, more shining, with basal and intermediate lobes broadly visible from above; the terminal lobe completely divided by a cleft extending to the base; ventral lobe brownish, not conspicuously developed. Legs slender, black, with only the knees yellow, and the basal joints of tarsi brown; fore femora with at most only a weak tuberosity beneath, which is sometimes hardly discernable; fore and middle femora posteriorly, and post-femora anteriorly, with a series of yellow hairs, or, those on the latter sometimes appearing black; post-tibiæ with an extensor series of same color hairs; otherwise the legs have only short pile and inconspicuous series of hairs. Wings (Fig. 163) brownish, with colored stigma. Length, 4.5 mm.; wings, 4.8 mm.

♀. Generally cinereous with brownish tinge; all pile and bristles yellow or whitish. Front parallel, narrower than face, brownish above and silvery at antennæ; ocellar bristles minute. Mesonotum somewhat indistinctly tri-vittate with brown; halteres and humeri yellow, bases of abdominal segments opake-black, which color is more or less diffused apically, sometimes nearly reaching the posterior margins; lateral tuft on first segment very conspicuous, of long white hairs or bristles; sixth segment somewhat shorter than second. Ovipositor (Fig 46) yellow, with black base. Legs with coxæ and femora black, but the apices of latter, tibiæ and tarsi yellow; sometimes the tibiæ are broadly infuscate medianly; all femora with a rather more distinctly developed tuberosity beneath than have the males (Fig. 120). Wings (Fig. 164) more grayish. Length, 3.8 mm.; wings, 4.8 mm.

Described from Europe. Before me are the following, upon which I have based the above description: Auburndale, Mass., 1 ♂; Mt. Greylock, Mass., 3 ♂; Mt. Equinox, Vt., 2 ♀. All collected by C. W. Johnson (*B. S. N. H.*) during May (Auburndale) and June. These are probably sexes of the same species. I cannot separate them from *pilosa* Zett., according to Verrall's description (1901 Verrall 71). The only differences seem to be in the less conspicuous femoral warts, the less grayish abdomen, and the darker legs of the males, while the females are practically identical. This form seems to be intermediate between this species and *vilosa* v. Ros. according to the development of the femoral warts. Williston's western species, *opaca*, differs in the venation as well as possessing black, instead of yellow bristles, his description being based upon a female. Of course there is a possibility of the above specimens belonging to a distinct species, but only comparison with the European *pilosa* will determine that question.

NEPHROCERUS Zetterstedt.

The species of this genus are in size the largest of the family. They may be readily distinguished by the reniform third antennal joint, the well developed bristles on the monosotal margin, and the inflated humeri and scutellum; the latter also having well developed bristles. In general appearance they are similar to those of the genus *Pipunculus*, differing in the above mentioned characters. Only one species is known here, *N. daecki* Johnson, described from Long Island; but there is another species reported from the White Mountains, New Hampshire (1897 Slosson 239).

PIPUNCULUS Latrielle.

In number of species this genus is the largest in the family. Distinguished by the generally acute third antennal joint, the apex of which is often drawn out into a long spiniform beak, and tho sometimes nearly round apically, there is always an indication of an angle; the occiput is puffed out and generally widely visible at the margin, but centrally concave and more or less closely applied to the thorax; all

bristles are small and indistinct; the head is larger in proportion than in the other genera. Of the specimens examined the eyes of all the males are in contact, unless otherwise mentioned, and the femora have flexor spines, although these are sometimes so minute as to be scarcely discernable under high magnification. The cleft of the hypopygium is understood to be on the right unless otherwise noted.

A knowledge of the life history of this group of insects would be a great help in the study, and it is only by breeding that many of the species can best be procured, as Mr. Perkins* has already done with his Australian and Hawaiian species. They are known to be parasitic on Homoptera.

TABLE OF SPECIES.

Males..... 1.
Females .....35.
1. Stigma colored, generally long and conspicuous..... 2.
Stigma hyaline, or very small .....26.
2. Fourth vein beyond post-cross vein with fork (Fig. 137) ..... 3.
Fourth vein normal..... 5.
3. Antennæ long, white acuminate .....18. **appendiculatus** n. sp.
Antennæ obtusely pointed..... 4.
4. Femora yellow; mesonotum only microscopically pubescent. North Carolina species.....31. **constrictus** Banks, n. sp.
Femora more or less blackened medianly; mesonotum distinctly pilose. Mexican species.....17. **elegantulus** Will.
5. Humeri brown or black ..... 6.
Humeri yellow or white.....18.
6. Legs entirely yellow; knobs of halteres black. 16. **atlanticus** Hough.
At least all femora with distinct black rings..... 7.
7. Hypopygium cleft..... 8.
Hypopygium not cleft.
Antennæ yellow.. .....5. ? **flavitarsis** Will.
Antennæ black ..... 17.
8. Hypopygium smaller than fifth segment, generally only a little visible, with apical cleft ..... 9.
Hypopygium as large, or larger than fifth segment and generally assymetrical .....11.
9. Halteres black or brown .....12.
Halteres white or yellow .....10.

* Rept. Exp. Sta. Hawaii. Sugar Plant. Ass., Div. Ent., Bull. No. 1, pt. 4, 1905.

10. Abdomen shining, with bases of segments opake; tibiæ and tarsi yellow .....20. **mainensis** n. sp.
Abdomen polished, with only apex of first silvery laterally. 34. **varius** n. sp.
11. Abdomen entirely opake, velvety-brown or black, without trace of gray; halteres brown. 21. **cingulatus** Loew. (**velutinus** n. var.).
Abdomen subopake, more or less cinereous, at most opake-black only at bases of segments..... 13.
Abdomen shining or polished, with bases of segments more or less velvety-black, at most only first segment and ventral margins cinereous.
Tibiæ largely brownish or black.....21. **cingulatus** Loew.
Tibiæ yellow, scarcely tinged with brown.....22. **fuscus** Loew.
12. Abdominal fasciæ all white.
Antennæ black, short acuminate.....6. ? **nigricornis** Adams.
Antennæ yellow .....5. ? **flavitarsis** Will.
Antennæ black, acute; ultimate section of fourth vein straight. Western species.....7. **alternatus** n. sp.
Abdominal fasciæ faintly grayish, or nearly shining, only first segment white; ultimate section of fourth vein strongly sinuate .....8. **nigripes** Loew.
Abdomen polished, at most only base cinereous..34. **varius** n. sp.
13. Antennæ yellow. Mexican species.....5. ? **flavitarsis** Will.
Antennæ black .....14.
14. Abdomen distinctly fasciated with white or gray, but bases of segments opake .....15.
Abdomen not distinctly fasciated, sometimes nearly shining.... 16.
15. Wings distinctly tinged with brown; hypopygium subhemispherical, small, cleft .....9. **semifasciatus** n. sp.
Wings hyaline, or gray, only faintly brownish. Missouri species. 6. ? **nigricornis** Adams.
16. Hypopygium quadrate in outline, much larger than the short fifth segment, with broad apical cleft (Figs. 60–61). 10. **caudatus** n. sp.
Hypopygium more semicircular, hardly larger than the large fifth segment, with moderate cleft (Fig. 52). 11. **discolor** Banks, n. sp.
17. Antennæ short, acute; stigma as long or longer than fourth costal section .....2. **dubius** n. sp.
Antennæ abruptly, short acuminate; stigma shorter than fourth section.....1. **loewii** Kert.
18. Legs yellow, or, at most with only femora discolored above.....19.
Femora black, at most only extremities yellow.....20.
19. Abdomen subopake; apices of segments with or without gray fascia.

Small species (3.0 mm.) .....15. **minor** n. sp.
Larger species (4.5 mm.).....16. **atlanticus** Hough.
Abdomen shining, with extreme bases of segments more or less opake-black; post-femora much thickened and somewhat discolored with brown (Fig. 121).....24. **femoratus** n. sp.
Abdomen shining, except first segment, and lateral margins cinereous; femora slender, not discolored.....33. **houghii** Kert.
20. Hypopygium cleft .....21.
Hypopygium not cleft.....24.
21. Abdomen opake, or subopake, more or less variegated with gray.....22.
Abdomen polished, at most gray only at base and ventral margins.....23.
22. Abdomen opake, brown and gray fasciated; tibiæ and tarsi yellow. 14. **aequus** n. sp.
Abdomen subopake, evenly brownish tinged, only faintly marked with gray.
New Mexico species .....12. **fuscitarsus** Adams.
New York species.....11. **discolor** Banks, n. sp.
23. Antennæ yellow, long acuminate; knobs of halteres black; wings hyaline, with only apical portion of stigma colored. 35. **tarsalis** Banks, n. sp.
Antennæ black, short, acute; halteres yellow; wings brownish. 23. **viduus** n. sp.
24. Abdomen subopake, with more or less grayish tinge on dorsum..25.
Abdomen polished, only grayish at base and laterally. 35. **tarsalis** Banks, n. sp.
25. Hypopygium small, shorter than fifth segment; abdomen subcylindrical.....3. **affinis** n. sp.
Hypopygium large, longer than fifth, very broad; abdomen ovate, distinctly broadest at third and fourth (Fig. 72). 4. **confraternus** Banks, n. sp.
26. Legs and antennæ entirely yellow .....27.
Legs yellow, with only a small, well defined, black, sub-basal femoral spot (Fig. 127); abdomen entirely shining black. 38. **atramontensis** Banks, n. sp.
Legs in part black.....29.
27. Abdomen opake, brownish, more or less cinereous. Mexican species.....40. **flavicornis** Will.
Abdomen shining, more or less yellow laterally.....28.
28. Antennæ acutely pointed. Mexican species. 39. **xanthopodus** Will.
Antennæ long, white acuminate.....40. **flavomaculatus** Hough.
29. Tibiæ mostly yellow; first and lateral margins of segments 2–4 densely cinereous; hypopygium very large and symmetrical. 36. **albofasciatus** Hough.

Tibiæ mostly black; abdomen shining, or obscured, at most, only faintly cinereous (*subvirescens* group).....30.

30. Post-trochanters with one tooth or appendage beneath.....31.
With two teeth or appendages beneath (Fig. 129). Western species. 52. **bidens** n. sp.
With, at most, only minute bristles or tufts of hair beneath.....32.

31. Post-femora with a basal tooth beneath (Fig. 125); post-tarsi distinctly dilated .....51. **appendipes** n. sp.
Femora without such tooth (Fig 132)....50. **unguiculatus** n. sp.

32. Hypopygium compressed to left.....44. **coquilletti** Kert,
Hypopygium more or less compressed to right, or small and apparently symmetrical .....33.
Hypopygium not compressed, much broader than long, subhemispherical (Fig. 105).....47. **insularis** n. sp.

33. Abdomen ovate; fifth segment trapezoidal in dorsal outline.....34.
Abdomen subcylindrical; shining; fifth segment rectangular in outline (Fig. 108).....43. **similis** Hough.

34. Abdomen sparingly clothed with fine, brownish pubescence, shining; at most, only ventral margins cinereous. 42. **subvirescens** Loew.
Abdomen with scattered, black, bristle-like hairs, shining; at most, only ventral margins cinereous.....46. **scoparius** n. sp.
Abdomen naked, without discernable hair or pile, subopake, or, more or less faintly submetallic, cinereous tinged. 45. **subnitens** n. sp.

35. Stigma colored, generally long and conspicuous.....36.
Stigma hyaline, or very small .....51.

36. Fourth vein with appendage beyond post-cross vein.....37.
Fourth vein simple and normal.....38.

37. Eastern species; sixth abdominal segment shorter than fifth; stigma much shorter than fifth section; occiput normal. 25. **brevis** n. sp.
Eastern species; sixth segment as long as fifth; stigma equalling fifth section; abdomen shining; occiput unusually puffed out (Fig. 124) .....18. **appendiculatus** n. sp.
Western species; sixth segment longer than fifth; stigma shorter than fifth section; abdomen shining..9. **acuminatus** n. sp.

38. Humeri brown or black.....39.
Humeri yellow or white.....43.

39. Legs entirely yellow; abdomen broad, distinctly fasciated with gray; antennæ acute; robust species.....16. **atlanticus** Hough.
Legs yellow except discolored femoral rings; entire first and second segments, and narrow apices of following cinereous. 20. **mainensis** n. sp.
Legs mostly black .....40.

40. Ovipositor much longer than its base.....41.
Not longer than its base.....42.
41. Ovipositor not more than twice as long, and gradually tapering from its large elongate base. .....8. **nigripes** Loew.
9. ? **semifasciatus** n. sp.
Slender, more than three times as long, and abruptly terminating its small globose base. Western species.
7. **alternatus** n. sp.
42. Abdomen broad, opake, or subopake, with gray fasciæ ; ovipositor longer than sixth segmeut.....2. **dubius** n. sp.
Abdomen broad, nearly shining, only grayish tinged laterally ; ovipositor not as long as sixth segment.
4. **confraternus** Banks, n. sp.
Abdomen shining, cinereous only laterally and a median stripe on the third segment ; femora not spinose.
26. **nitidiventris** Loew.
Abdomen shining, cinereous only laterally ; femora distinctly spinose.....27. **horvathi** Kertesz.
43. Abdomen opake, or subopake, cinereous to nearly shining, but never polished.....44.
Abdomen polished, at most only base and lateral margins cinereous.....48.
44. Legs yellow, at most only femora discolored medianly.
Small species (3.0 mm.) .....15. **minor** n. sp.
Larger species (4.5 mm. and over).....45.
Femora black, at most only extremities yellow.....46.
45. Antennæ short, acute.....16. **atlanticus** Hough.
Antennæ very long, white acuminate .....14. **aequus** n. sp.
46. Ovipositor extending to second segment...13. ? **subopacus** Loew.
Ovipositor shorter, hardly reaching apex of fifth.....47.
47. Abdomen opake, with gray fasciæ.....3. **affinis** n. sp.
Abdomen and scutellum nearly shlning, only grayish tinged laterally.....4. **confraternus** Banks, n. sp.
48. Legs entirely yellow ; femora slender ; ovipositor very short, with globose base .....33. **houghii** Kert.
Legs yellow ; femora much thickened ; base of ovipositor elongate.
24. **femoratus** n. sp.
Femora black, or with extremities more or less yellow .....49.
49. Antennæ with third joint black.....50.
Third joint yellow.....32. **luteicornis** n. sp.
50. Ovipositor slender, curved, longer than, and abruptly terminating its elongate base (Fig. 86).....30. **alpinus** n. sp.
Ovipositor short, abruptly terminating its large base ; femora mostly black (Fig 94) ....28. **angus** n. sp.
Ovipositor stout, gradually tampering from, its more or less elongate base ; legs mostly yellow (Fig. 87))..... 29. **sororius** n. sp.

51. Legs entirely yellow. Mexican species .....52.
Femora in part black .....53.
52. Abdomen shining black, more or less cinereous laterally, antennæ long acuminate.....41. **willistonii** Kert.
Abdomen opake, brownish, densly cinereous laterally; antennæ acute.....40. **flavicornis** Will.
53. Tibiæ mostly yellow; abdomen elongate, subcylindrical, shining. 37. **flavomaculatus** Hough.
Tibiæ mostly yellow; abdomen short, robust, subopake and more or less fasciated.....36. **albofasciatus** Hough.
Tibiæ mosty black (*subvirescens* group).....54.
54. Abdomen subopake, or more or less submetallic, cinereous tinged. Western species.....45. **subnitens** n. sp.
Abdomen shining, or at most only ventral margins cinereous...55.
55. Uppermost part of front shining or polished, only silvery near antennæ.....56.
Front, except vertex, silvery or cinereous.....48. **albiseta** n. sp.
56. Post-trochanters and all femora with two or three long, distinct, bristles near bases beneath (Fig. 128). Western species. 49. **proximus** n. sp.
Post-trochanters with, at most, very short hairs or bristles; abdomen ovate, with segments somewhat constricted at incisures .....43. **similis** Hough.
Post-trochenters with minute scopa; abdomen slender, not constricted at incisures (Fig. 131).....46. **scoparius** n. sp.
Post-trochanters unarmed; abdomen normal .....57.
57. Abdomen polished all over.....51. **appendipes** n. sp.
Abdomen cinereous on ventral margins and more or less apically. 47. **insularis** n. sp.

DESCRIPTIONS OF SPECIES.

Group I.

Stigma colored; abdomen opake, or subopake; third section of fourth vein generally about twice as long as fourth.

1. **P. loewii** Kertesz, *fasciatus*‖ Loew.

♂. Opake-black; antennæ black; third joint short and obtuse. Mesonotum opake, brownish-gray. Bases of abdominal segments opake, black; apex of first densely white; apices of following grayish, becoming whiter, thinner and less opake laterally. Hypopygium moderate, black, not cleft. Legs black, apices of femora, bases of tibiæ yellowish. Wings grayish; the colored stigma shorter than fourth section. Length, 3.5 mm.; wings, 4.1 mm.

Described from Texas. I do not know this species, but

the stigma being shorter than the fourth section of costa, should distinguish it among those with non-cleft hypopygium.

2. **P. affinis** n. sp.

♂. Front and face silvery; occiput brownish or grayish; antennæ black, but third joint brownish, long white acuminate. Mesonotum rather opake, brownish, more or less cinereous along margins; scutellum concolorous. Pleura and metanotum cinereous to nearly white; humeri yellow; knobs of halteres black or brown, with brown or yellow pedicles. Abdomen subcylindrical, opake to subopake, brownish; apical margins and ventral margins of segments cinereous; fifth longer than fourth. Hypopygium (Fig. 80) small, cinereous tinged, not cleft; lateral and intermediate lobes just visible at extreme left; ventral lobe yellow. Legs slender; coxæ, femora except bases and apices, more or less developed; tibial ring, and apical joint of tarsi, black, otherwise the legs are yellow; inner surface of post-femora polished; spines weak; post-tibiæ slightly swollen at the middle, nearly straight. Wings (Fig. 166) grayish; stigma colored. Length, 3.8 mm.; wings, 4.4 mm.

♀. Similar to male, with front entirely silvery to the vertex; broad margins of mesonotum cinereous, leaving only the disc brown; scutellum also more grayish; sixth abdominal segment shorter than fourth, with a distinct longitudinal groove on middle of dorsum, entirely grayish tinge; ovipositor (Fig. 81) yellow, very short, hardly reaching apex of fifth ventral segment, abruptly terminating its broad, short, grayish tinged base, which hardly protrudes beyond the sixth segment. Wings are very long in proportion. Length, 3.8 mm.; wings, 6.0 mm.

Type.—♂. Cottage Beaulieu, Beaulieu, Quebec, June 14, 1906 (Figs. 13, 166, *Beaulieu, coll. Johnson*).

Paratypes.—St. Johnsbury, Vt., 1 ♂; Burlington, Vt., 1 ♀, Fig. 81; Barnstable, Mass., 1 ♀ (all by *Johnson, B. S. N. H.*); Great Falls, Va. (1 ♀, *coll. Banks*). Taken in June and July.

The males of this species seem to agree with those considered by Dr. Hough to be *subopacus* Loew, but the females do not agree with his description as to the ovipositor; and it does not seem probable that I have separate species in the two sexes before me. Dr. Hough (1899 Hough 79) describes the abdomen as brown-black, almost shining, with apices of segments whitish pollinose; halteres yellow; femora black, with apex sometimes yellow, tibiæ varying from yellowish with black rings, to black with yellowish

bases; tarsi black-brown, with joints 1–2 yellowish; third section of fourth vein twice the second. This shows but little variation from these males. This species as here represented is distinguished by its small size, non-cleft hypopygium, short ovipositor, and black femora.

3. **P. dubius** n. sp.

♂. Bare, entirely black, except humeri brown, squamulæ yellow, halteres brown, pedicle yellow, extreme apices of femora, extreme bases and apices of tibiæ, yellow, basal joint of tarsi brown; antennæ (Fig. 30) rather abruptly short acuminate. Front and face silvery; occiput cinereous and brown. Mesonotum opake, brown pollinose; pleuræ and metanotum lightly cinereous. Abdomen opake to subopake; the narrow apical margins dilating into the broad ventral angles of segments 1–5 cinereous, semi-opaque, the broad bases of segments 2–4 brownish black becoming opake at extreme bases; fifth more shining, broadly cinereous tinged, brownish at base; hypopygium (Fig. 58) shining black, but faintly cinereous, small rather symmetrical, not cleft, but intermediate lobe fully visible, ventral lobe little developed, brownish. Legs rather slender, mostly black and cinereous, with inner surface of post-femora polished; spines weak. Wings (Fig. 138) grayish hyaline; stigma colored. Length, 2.8 mm.; wings, 3.8 mm.

♀. Front entirely shining, except just above antennæ; antennæ (Fig. 31) long acuminate; halteres yellow or with brownish knobs. Abdomen short, broadest at third and fourth segments, subopake, bluish-gray, with extreme bases of segment opake-brown; all are subequal in length, but sixth longer, grayish, and deeply grooved medianly, so much so as to make it appear to be composed of two separate plates. Ovipositor (Fig. 59) slender, brownish, abruptly thickened basally, extending to base of abdomen; articulated with, and abruptly terminating its subglobose grayish base. Only extreme base of tibiæ yellow; the tarsi are entirely black. Stigma of wing only colored at apical portion; the second section of fourth vein varying in the two specimens from $\frac{1}{2}$ to nearly $\frac{1}{3}$ of third section.

Type.—♂. Capens, Maine, July 15, 1907 (Figs. 30, 58, 138, *Johnson*, *B. S. N. H.*).

Paratypes.—Capens, Maine, 3 ♂s, 1 ♀, Fig. 31; Machias, Maine, 1 ♀, Fig. 59; Burlington, Vt., 1 ♂ (all by *Johnson*, *B. S. N. H.*); Kingston, R. I. (2 ♂s, *Barlow*, *B. S. N. H.*). Taken in June and July.

The male, from Burlington, Vt., has slight variation in the cinereous coloration of the abdomen, being less pro-

nounced on the apical margins of segments, and the brown bases more opake, giving more contrast; also the front is more yellowish in color. A mutilated female from Highrolls, N. M. (*Viereck, A. N. S.*), comes very near this species, but the condition does not warrant its use as a type. The abdomen is grayish laterally only, and the legs are more yellow, the tibiæ being almost entirely so.

This species, in size and general appearance, approaches Loew's *nigripes*, but Dr. Hough says the hypopygium is cleft, which is not the case with these specimens, thus suggesting *loewii* Kertz (*fasciatus* Lw.), from which it differs in having the antennæ acuminate and the stigma longer than the fourth section of the costa.

4. **B. confraternus** Banks n. sp.

"Similar to *P. subopacus*, but the female has a very short ovipositor. ♂. Face and front silvery; antennæ (Fig. 34) dark, with long white tip to the third joint; occiput hoary; thorax brown-black, scutellum more shining, sides barely hoary; abdomen rather broad and flat, nearly shining, but somewhat greenish-black, the basal segment hoary, the sides of segments faintly hoary, legs pale, but femora with a broad dark band, leaving base and apex paler. Wings (Fig. 139) gray hyaline, stigma distinct, small cross-vein just below end of the auxillary, and slightly before end of basal third of cell. The last segment of abdomen is even from above and rather broad, the hypopygium bent under and not at all promient. Length, 3.3 mm.; wings, 3.8 mm."

♀. Similar. Front with parallel orbits, shining black, silvery just above antennæ. Abdomen not flattened, nearly shining; ovipositor short (Fig. 74), hardly longer than its base; fifth segment longer than fourth.

Type.—♂. Sea Cliff, Long Island (Figs. 34, 72, 73, 139, *coll. Banks*).

Paratypes.—Sea Cliff, Long Island (1 ♂, 1 ♀, Fig. 74 *coll. Banks*), Swarthmore, Pa. (1 ♂, *Cresson, A. N. S.*); Falls Church, Va. (1 ♀, *coll. Banks*). Taken in July and August.

In addition to the above description I note the following: Humeri yellow; halteres brownish-yellow; abdomen more or less brownish in certain aspects (I cannot distinguish any greenish tinge); fifth segment of male only slightly longer than fourth; hypopygium more shining, lightly tinged with gray and brown, very large (Figs. 72–73), semi-globose,

nearly as broad as fifth and much longer, not cleft; intermediate lobe fully visible at sides; ventral lobe small and brown; legs rather slender with weak spines; apical and basal joints of post-tarsi in proportion 1:3; wings short with colored stigma.

This species is at once distinguished by the nearly shining indistinctly marked abdomen, the large globose hypopygium and short ovipositor. There is a male in the collection here without data, except label marked "Sept." It is very pale and much bleached, the legs almost entirely yellow.

5. **P. flavitarsis** Williston.

♂. Front and face silvery; antennæ black; third joint acute, yellow. Mesonotum and scutellum brownish; pleura grayish. Abdomen blackish-brown, subopake; first segment and apices of following opake gray. Legs black; extreme apices of femora, greater part of tibiæ and tarsi, yellow; femora not markedly thickened. Wings nearly hyaline; stigma yellow. Length 4.0 mm.

Described from Mexico. The description is too short to be of much value, but it seems to place the species very close to *nigricornis* Adams.

6. **P. nigricornis** Adams.

♂. Front and face silvery; antennæ black, with third joint short acuminate. Mesonotum brownish; pleura and metanotum silvery pollinose; scutellum subopake; halteres black. Abdomen black, subopake; apex of first, interrupted apices, dilating laterally, of 2–4, and broad apex of fifth, white. Hypopygium black, cleft. Femora, except bases and apices, black; tibiæ, except median ring, yellow; inner surface of post-femora polished. Wings hyaline; stigma fuscous. Length, 4.2 mm.; wings, 5.0 mm.

Described from Missouri. The species is unknown to me, but seems to be allied to the following. In the table of species I assume that the humeri are black.

7. **P. alternatus** n. sp.

♂. Front brownish or grayish; face silvery; antennæ brownish-black, with third joint broadly acute (Fig. 18). Mesonotum bare, opake brown; lateral and broad anterior margins cinereous, with rudiments of a pair of median brown vittæ. Scutellum opake-brown; pleuræ and metanotum cinereous; halteres and humeri brown or blackish. Abdomen opake, with bases of all segments velvety-brown; apices and broad lateral angles cinereous and more shining; segments 2–4 subequal and fifth as long as third and fourth together. Hypopygium

small, much shorter than fifth, with a shallow apical cleft. Legs black, grayish, with apices of femora, bases of tibiæ, and tarsi, yellow; flexor and inner surfaces of post-femora polished. Wings hyaline with stigma twice the fourth section (Fig. 160). Length, 3.8 to 4.4 mm.; wings, 5.3 to 5.6 mm.

♀. Front and face silvery, former with a fine median black vitta expanding into the shining vertex; antennæ with third joint acute and minutely spiniform apically. Mesonotum opake-brown, anteriorly and laterally cinereous. Ovipositor long, straight and yellow. Similar to Fig. 54 but longer, extending to base of abdomen, abruptly terminating its small shining black globose base,. Wings hyaline with short stigma, only one-half as long as fourth section. Length, 4.2 mm.; wings, 4.5 mm.

Type.—♂. Cloudcroft, New Mexico, June 18, 1902 (Fig. 160, *Viereck, A. N. S.*), No. 5024.

Paratypes.—Same locality, 1 ♂, 1 ♀. Taken in May and June.

This species seems very close to *loewii* Kert., but the hypopygium is cleft, and the stigma of male is distinctly longer than fourth section.

8. **P. nigripes** Loew.

This species was described from Pennsylvania, and also reported from New Jersey (1899 Smith 665), and New Hampshire (1902 Slosson 7). I have before me two males from Lansdale, Pa., July (Figs. 4, 53, *Cresson, A. N. S.*), and Ithaca, N. Y. (Fig. 123, *coll. Banks*), which seem to agree with Dr. Hough's description excepting in size, wherein these specimens are much larger (4.4 to 4.8 mm., while Loew gives the type as $1\frac{1}{6}$ lines or 2.5 mm.); these also have the antennæ acute, not short acuminate, as Dr. Hough gives it.

♂. Entirely black, bare, only extreme bases of tibiæ yellow. Front brown; face sericeous with brownish tinge; occiput cinereous. Antennæ acute (Fig. 4). Mesonotum and scutellum semi-shining, faintly brownish. Pleuræ and metanotum more or less cinereous. Abdomen short conical, little longer than thorax; margin of first segment silvery; following segments opake, nearly black basally, with the broad apices of a black graphite appearance, tinged with gray in some aspects, but ventral margins distinctly cinereous. Hypopygium more shining, rather small (Fig. 53), cleft; only the terminal lobe visible from above. Legs slender, post-tibiæ gently arched, or in the specimen from Ithaca, rather distinctly angular (Fig. 123); spines weak. Wings (Fig.

167) hyaline; colored stigma equalling or longer than fourth section. Length, 4.4 mm.; wings, 5.0 mm.

There are also three females from: Manomet, Mass. (*Johnson, B. S. N. H.*); Ithaca, N. Y. (Figs. 3, 55, *coll. Banks*); and Glencarlyn, Va. (Figs. 54, 167, *coll. Banks*). Taken in June and July. These probably belong to the foregoing males, although there may be two distinct species, one of which is represented by the specimen from Glencarlyn, seeming to differ in the shape of the ovipositor (Fig. 54).

♀. Front with a raised shining longitudinal area above, attenuating anteriorly; lower part and face silvery; antennæ (Fig. 3) acuminate. Mesonotum subopake, brownish; lateral margins of pleuræ and metanotum cinereous, the latter more whitish. Abdomen subopake, brownish pollinose with apex of first segment narrowly white; ventral margins and lateral angles, becoming thinner dorsally, or in some aspects entire apical margin of segments 2–5, and nearly all of sixth, cinereous; extreme bases of all segments opake-brown or black; second to fourth segments subequal in length. Base of ovipositor cinereous, elongate-conical (Fig. 55), tapering into the long slender, straight, yellow ovipositor, which extends to middle of thorax. Wings short, hyaline. Length, 4.4 mm.; wings, 4.4 mm.

The species as here designated may be distinguished by its nearly totally black appearance contrasted by the silvery band on first segment of abdomen and the complete apical subopake or grayish bands of following segments. I am not at all satisfied with this determination. There seems to be, at least, two distinct species here.

9. **P. semifasciatus** n. sp.

♂. *Front and face silvery;* occiput brownish to cinereous; antennæ black, acute, similar to *nigripes* (Fig. 3). Mesonotum and scutellum subopake, brown pollinose. Pleuræ and metanotum cinereous; humeri and halteres black, latter with pedicles brown. Abdomen short, hardly longer than thorax; first segment white apically; following segments opake-brown with apices and lateral angles subopake cinereous, *broadly interrupted medianly*, the interruptions diminishing in width successively, so that on the apical segments the basal brown portion just reaches the apices of segments in middle; venter opake-black. Hypopygium large (Fig. 47), rather shining and faintly brownish; intermediate lobe rather unusually developed below, and more or less wrinkled; terminal lobe with cleft, far to right, having a distinct appendage; ventral lobe black, not much developed. Legs black; trochanters brown; extreme apices of femora, bases of tibiæ and tarsi,

yellow; apices of tibiæ brownish; femora moderately stout; post-tibiæ strongly arcuate, spines weak; inner surface of post-femora polished. *Wings decidedly brownish tinged;* stigma colored. Length 4.4 mm.; wings, 5.0 mm.

♀. Similar, especially to those placed under *nigripes* Lw., differing mainly in the apex of first abdominal segment being cinereous, not white, and much broader and interrupted medianly. The specimen examined is somewhat soiled, and the apices of following segments are not gray, but in certain aspects one can perceive faint indications of interrupted apical bands; the ovipositor is very long and slender (Fig. 48), gradually tapering from its elongate base; wings hyaline, stigma shorter than fourth section; ultimate section of fourth vein strongly sinuate.

Type.—♂. Mt. Tom, Mass., July 14, 1905, Fig. 47, *Johnson, B. S. N. H.*).

Paratypes.—Chain Bridge, Va. (1 ♂, Fig. 181, *coll. Banks*), Hanover, N. H. (1 ♀, Fig. 48, *Johnson, B. S. N. H.*). Taken in June and July.

This species may be separated from *nigripes* Lw., as here represented, by the silvery front and face, interrupted gray abdominal fasciæ and brownish wings of ♂, while the ♀ is only distinguished by the absence of the pure white narrow band of first abdominal segment. It is a question whether this female specimen is distinct from that species.

10. **P. caudatus** n. sp.

♂. Front and face sericeous, with yellowish tinge; occiput brownish-gray. Antennæ black, abruptly acuminate (Fig. 15). Thorax subopake, brownish tinged; pleuræ, especially metanotum cinereous tinged. Humeri and halteres black. Scutellum more shining. Abdomen nearly shining, brownish tinged; first, interrupted medianly, lateral angles and ventral margins of following segments weakly cinereous; fifth longer than fourth. Hypopygium nearly shining, terminal lobe very large (Figs. 60–61), as broad as, and about twice as long as fifth segment, quadrate, flattened apically by the large cleft; intermediate lobe just visible; ventral lobe black. Legs black, with trochanters, extreme apices of femora, and tarsi basally, yellow; tibiæ brownish, with dark median rings. Inner surfaces of post-femora polished; spines rather strong. Wings (Fig. 140) grayish; with stigma colored. Length, 3.5 mm.; wings, 3.8 mm.

Type.—Sea Cliff, Long Island, 5–10 Sept. (*coll. Banks*).

The abdomen is somewhat shrunken longitudinally, and is probably a little longer than given. The species is rather

unique in having the abdomen nearly shining, with hardly any cinereous markings, and the large quadrate hypopygium.

11. **P. discolor** Banks, n. sp.

"♂. In the first section, with colored stigma and dull abdomen, the third joint of antennæ elongate, but not as much so as in *P. subopacus*, and dark colored, not white as in that species. It is also larger than that species. The face is silvery, the dorsum of thorax and abdomen dull black, the latter only indistinctly hoary on the sides; the legs pale, all femora black, except at base and tip. The wings are long, gray, with distinct stigma and black veins, the small cross vein before end of first third of cell, and a trifle before end of auxillary vein, the stigma being quite long, anal cell closed much before margin. The last segment of male abdomen is small and without cleft, but with a cavity at tip; the abdomen is longer than in *P. subopacus*, and does not show the tufts of hair on venter seen in that species. Length 4.5 mm."

Type.—Ithaca, N. Y., July (*coll. Banks*).

Paratype.—Ithaca, N. Y., July, one ♂ (*coll. Banks*).

I make the following notes upon examination of the type: Front and face with yellow tinge; antennæ abruptly acuminate (Fig. 27), somewhat sericeous; mesonotum and scutellum subopake, brown pruinose; humeri yellowish; halteres dark brown; pleuræ and metanotum faintly cinereous, the latter more densely so; abdomen opake, brownish; hypopygium (Fig. 52) rather large, as large as fifth segment; terminal lobe subquadrate, brownish with large cleft; basal and lateral lobes just visible; intermediate lobe visible from above; ventral lobe yellowish; tarsi blackish apically; femoral spines not discernable; stigma equalling fourth section or a little longer (Fig. 177).

This species comes near *fuscitarsis* Adams, from New Mexico, but is probably distinct; it is also similar to my *caudatus* but not so shining, and has the hypopygium less developed.

12. **P. fuscitarsis** Adams.

♂. Antennæ black, short acuminate; mesonotum brown pollinose with yellowish humeri and blackish halteres; abdomen evenly brown pollinose, with hypopygium cleft; femora and tibiæ mostly black; tarsi brown; wings brownish with distinct stigma. Length, 4.5 mm.; wing, 5.2 mm.

Described from New Mexico.

A male before me from Cloudcroft, New Mexico, VI, 20, 1902 (Viereck), may be this species, I append a brief description.

Bare, brown pollinose. Front and face silvery. Antennæ black with third joint ovate (Fig. 5), rather abruply spiniform apically. Mesonotum and scutellum opake, brown pollinose or the latter subopake; humeri yellow; pleuræ and metanotum gray; halteres blackish. Abdomen subopake, brownish, with lateral apical margins of 1–4 segments and broad apical margin of fifth whitish; hypopygium more shining, as long as fifth segment; cleft extending to base (Fig. 57); intermediate lobe visible, ventral lobe small, yellowish. Legs black with apices of femora and bases of tibiæ yellow; apices of tibiæ and all tarsi brown; apical flexor series of femoral bristles minute, and middle tibiæ distinctly bowed. Wings long (5 mm.), brownish-hyaline, with the stigma brownish (Fig. 141). Length, 4.5 mm.; wings. 5.0 mm.

13. **P. subopacus** Loew.

♀. Front black; face silvery. Antennæ black, long white acuminate. Mesonotum subopake, thinly brownish-gray pollinose; pleuræ cinereous; metatotum densely so; halteres yellow. Abdomen brownish-black, almost shining; first apically, lateral angles and ventral margins of following segments, cinereous. Ovipositor straight, as long as segments 2-5. Legs yellow, with femora, except apices, tibial rings and apices of tarsi, black. Wings grayish, with colored stigma equalling fourth section; third section of fourth vein twice second. Length, 3.5 mm.; wings, 3.7 mm.

Described from District of Columbia. Also reported from Mexico (1892 Williston 88) and Canada (1901 Chagnon 13). I cannot locate this species, with certainly, among the material at hand. Dr. Hough (1899 Hough 79) describes a male which he considers this species, having a small non-cleft hypopygium; and I have some before me which agree except in having unusually large non-cleft hypopygium, but which seem to belong to females of another species having very short ovipositor, *confraternus* Banks. However, I have a female from North Carolina which may be this species, but I am rather doubtful, and will give a description of it as follows:

Head and mesonotum, unfortunately, are very greasy and in no condition for description, but it seems that the front is only silvery on lower part, and the third antennal joint is light colored and long acu-

minate (Fig. 13). Humeri yellow; scutellum subopake, cinereous tinged; pleuræ and metanotum nearly white pollinose; halteres sordid yellow. Abdomen subopake; apex of first segment whitish; second basally, lateral and ventral margins of 2-5, and all of sixth excepting a median stripe, cinereous. Ovipositor yellow, extending to apex of second segment, rather abruptly tapering from its elongate shining black base. Coxæ and femora, except apices of latter, black; tibiæ and tarsi, except apices of latter, yellow; apical and basal joints of post-tarsi in proportion of 1:2; femoral spines hardly discernable; outer surfaces of femora and tibiæ silvery tinged. Wings hyaline with colored stigma. Length, 3.8 mm.; wings, 4.4 mm.

From Black Mountain, N. C. (*coll. Banks*).

A male from the same locality (Fig. 62) may possibly belong to this female, but I cannot separate it from the males of *confraternus* Banks. It only has the second section of fourth vein shorter than that of the type of that species (Fig. 144).

14. **P. aequus** n. sp.

♂. Bare species. Front and face silvery; occiput cinereous; second antennal joint black, third yellow, long white acuminate (Fig. 12); proboscis and palpi yellow. Mesonotum opake, brownish pollinose medianly, cinereous and more shining laterally; scutellum subopake, brownish. Pleuræ faintly cinereous, metanotum more so; humeri yellow; halteres yellow with brown knobs. Abdomen opake; first segment white pollinose and following opake-brown, with apical margins and ventral margins cinereous, sometimes faintly shining, which color is broadly interrupted dorsally, at times the extreme apical margins appear cinereous. Hypopygium (Fig. 64) cinereous, moderately developed and slightly compressed, with cleft having more or less distinct keel; ventral lobe yellow. Coxæ and femora, except extreme bases and apices, black, otherwise legs yellow, but apical joint of tarsi brown; femora rather slender with weak spines: post-tibia arcuate, slightly thickened medianly; inner surface of post-femora polished. Wings (Fig. 180) decidedly brownish, stigma colored. Length, 5.0 mm.; wings, 5.5 mm.

♀. Similar. Front black, only silvery at antennæ; the cinereous apices of abdominal segments more complete, only narrowly interrupted medianly where there seems to be a slight depression on each segment; fifth segment longer than fourth; sixth only narrowly brown at base. Ovipositor yellow, very short, broadly attached to its large, retracted, grayish-black base. Legs mostly yellow with coxæ and upper median part of femora black; apical and basal joints of post-tarsi in proportion of 1:2; claws very long. Wings hyaline with colored stigma equalling or shorter than fourth section.

Type.—♂. Hyannisport, Mass., July 4, 1909 (Figs. 12, 64, 180, *Johnson*, *B. S. N. H.*).

Paratypes.—Auburndale, Mass. (1 ♂, Fig. 66, *Johnson*, *B. S. N. H.*); Delaware Water Gap, Pa. (1 ♂, *coll. Johnson*); Glencarlyn, Va. (1 ♀, Fig. 65, *coll. Banks*). Taken in June and July.

The specimen from Auburndale shows little variation in the extent of the cinereous and brown abdominal markings, sometimes the former extending entirely along the apical margin in some aspects, while in others broadly interrupted; the general appearance of the abdomen is more shining; hypopygium more extended and the cleft very wide (Fig. 66); antennæ brown or blackish, white pilose. The specimen from the Delaware Water Gap has the cinereous abdominal apical margins broadly interrupted; post-femora and tibiæ more robust; anterior cross-vein not so far basad the discal cell. There is a ♂ from Manchester, Vt., June 8, 1910 (*Johnson*), which may be a distinct species, having antennæ entirely black; lateral margins of mesonotum brown but of lighter color than the middle; pleuræ and metanotum less cinereous. Abdomen nearly entirely black or brown, subopake, with lateral apical margins of segments lighter brown, hardly cinereous; hypopygium much extended, cleft very wide, so that the terminal lobe is scarcely visible. Otherwise similar to the type.

The females of this species are similar to those of *atlanticus*, but the antennæ are long acuminate.

15. **P. minor** n. sp.

♂. Front and face silvery; occiput cinereous. Proboscis yellow; third antennal joint yellow, long acuminate (Fig. 28). Mesonotum subopake, brownish medianly; laterally pleuræ and metanotum cinereous. Scutellum more shining, black; humeri and halteres yellow. Abdomen subopake, brownish pollinose; apical margin of first and lateral angles of following segments dark grayish, leaving the brown portion of each with a convex posterior margin. Hypopygium little developed (Fig. 90), not noticeably compressed laterally, cleft, shining and faintly brownish-cinereous; all the lobes quite distinct, the ventral one yellow; ventral segments yellowish with distinct yellow longitudinal lineations (these markings are due to the shrinking of the ventral membrane). Legs yellow, coxæ, narrow femoral ring and apices of

tarsi, blackish; femoral spines weak; post-tibiæ slightly bowed; apical and basal joints of post-tarsi in proportion 1:2. Wings grayish with colored stigma (Fig. 153). Length, 3.0 mm; wings, 3.8 mm.

♀. Front with upper half polished; abdomen nearly shining, with the brown bases broader and less attenuating laterally; the cinereous apices narrower and less distinct in contrast, and limited mostly to the lateral angles; sixth segment nearly equalling fifth, with a shallow longitudinal groove, entirely brownish-gray; base of ovipositor brownish, subquadrate, as long as sixth segment; ovipositor yellow, very short, abruptly terminating and hardly as long as its base (Fig. 91).

Type.—♂. North Haven, Conn., August 3, 1905 (Fig. 28, 90, 153, *Viereck*, *B. S. N. H.*).

Paratypes.—Auburndale, Mass. (1♂, 1♀, Fig. 29, *Johnson*, *B. S. N. H.*); Lenola, N. J. (1 ♂, *coll. Johnson*); Germantown, Pa. (2 ♂s, *Harbeck*, *coll. Johnson*); Ithaca, N. Y. (1 ♀, Fig. 91, *Barlow*, *coll. Johnson*); Falls Church, Va. (1 ♂, *coll. Banks*); Black Mountain, N. C. (1 ♀, *coll. Banks*). Taken May to August.

These vary but little in size, coloration, and abdominal markings; the hypopygium is sometimes more developed and showing some lateral compression, with the cleft decidedly to the right. The small ovipositor, cleft hypopygium, yellow humeri, legs and antennæ, as well as its small size, will easily distinguish this species. It is somewhat more shining than *affinis*. A male from Ashland Junction, Me. (*Johnson*, *B. S. N. H.*), and another from Riverton, N. J. (Fig. 154, *coll. Johnson*), are larger and the hypopygium more developed, also the femora of the former are darker. These may belong to a distinct species.

16. **P. atlanticus** Hough.

♂. Front and face silvery; occiput white. Antennæ yellow-brown or black, with silvery tinge, acute; arista black (Fig. 11). Mouth parts brown or yellow. Mesonotum brown pollinose, margins, pleuræ and metanotum, cinereous. Scutellum subopake, brownish; humeri and halteres brown or black with pedicles of latter yellow. Abdomen broad, parallel sided, all segments subequal; subopake to nearly shining with apical margin of first, ventral margins and the interrupted medianly apical margins of following segments, cinereous. Hypopygium larger than fifth, subopake, brownish and grayish; basal lobe sometimes narrowly visible; lateral and intermediate lobes distinct, the latter visible from above; terminal lobe with shallow cleft, which

is sometimes only suggested by a slight opake-brown depression; veneral lobe large, yellow, often visible from above (Fig. 49). Legs, except coxæ and apices of tarsi, yellow; femora sometimes discolored above, moderately thickened, with all outer surfaces as well as those of tibiæ, more or lese silvery; spines weak. Wings grayish with colored stigma (Fig. 133). Length, 4.5–5.3 mm.; wings, 5.0–6.3 mm.

♀. Similar, with front much narrower than face, entirely silvery, with a fine median black line. Mesonotum in some seem to be more grayish with three faint median brown stripes, also the scutellum is more grayish in some. Base of ovipositor brown or yellow, quadrate, nearly cubical, abruptly terminated by the short stout yellow ovipositor, which is hardly longer (Figs. 50–51).

This species is not easily confused with any other on account of its large size, the subopake abdomen with its white pollinose margins and fasciæ, and yellow legs. *P. houghii* Kert. (*lateralis* Walk), has the abdomen polished without white fasciæ.

Described from Massachusetts and Pennsylvania, and is also reported from New Jersey (1899 Smith 665) and Canada (1901 Chagnon 13). I have examined specimens from Hanover, N. H., 1 ♂; Hyannisport, Mass., 1 ♂, (Fig. 11, 49); East Walpole, Mass., 1 ♂; Winnapauk, Ct., 1 ♂ (all by *Johnson*, *B. S. N. H.*); Fall River, Mass. (1 ♀, *Easton*, *B. S. N. H.*); Ithaca, N. Y. (1 ♂, Fig. 135, *coll. Banks*); Sea Cliff, Long Island (3 ♂s, Fig. 133, *coll. Banks*); Swarthmore, Pa. (1 ♀, Fig. 134, *Cresson*, *A. N. S.*); Falls Church, Va. (3 ♀s, Figs. 50. 51, *coll. Banks*); Black Mountains, N, C. (5 ♂s, Fig. 136, 2 ♀s, *coll. Banks*). Taken in May, June and July. Those taken in May seem to have the antennæ brown to black, and the femora more discolored.

This is about the largest known North American species of the genus. The variation seems to be confined to the coloration of the antennæ and femora, although the base of ovipositor is sometimes rather less developed, losing its quadrate form. I cannot separate the forms with black antennæ, from the others specifically, and seem to be identical although a little smaller. I have before me two males which show some abnormalities in the venation. One from Ithaca (Fig. 135) has an angular bend in the ultimate section of fourth vein indicating a rudiment of an appendage; this

is present in both wings. The other, from the Black Mountains (Fig. 136) has in both wings a well developed appendage from the post-cross-vein into the discal cell. These examples seem to point to the possibility that the absence or presnce of the appendages should not be depended upon as specific characters.

Group II.

Stigma colored; abdomen more or less shining; third section of fourth vein generally about twice as long as fourth.

17. **P. elegantulus** Williston.

♂. Front and face silvery; antennæ black; third joint silvery pubescent, obtusely pointed. Mesonotum deep brown, moderately shining, distinctly pilose; pleuræ and metanotum gray. Abdomen deep black, shining, whitish pilose; first segment, and lateral angles of following, opake-gray. Hypopygium large, black, moderately shining, thinly pollinose, reddish below. Legs yellow; femora stout, with distinct spines, more or less broadly blackened medianly, apical joint of tarsi black. Wings nearly hyaline; stigma yellow; ultimate section of fourth vein with appendage. Length 4.5 mm.

Described from Mexico.

18. **P. appendiculatus** n. sp.

♂. Front and face silvery; occiput white. Antennæ with second joint black; third brown, white pilose with long acuminate apex. Mesonotum subopake, more shining and cinereous laterally; brown pollinose; laterally, pleuræ and metanotum cinereous. Scutellum opake brownish, with fine marginal hairs; humeri black; halteres brown or yellowish. Abdomen subopake to nearly shining, faintly brownish pollinose; apical margin of first whitish; lateral angles of following segments cinereous, those of fifth extending dorsad in form of oblique spots; hypopygium moderately developed, a little compressed to right, with apical cleft; intermediate lobe hardly visible; ventral lobe small, black; lateral margins of all segments with scattered yellowish pile. Coxæ and femora black, trochanters, extreme bases and apices of femora, tibiæ excepting median brown rings, tarsi except apical joints and pulvilli, yellow. Femora moderately thickened, all with distinct flexor spines; posterior surface of middle femora with complete series of long yellow hairs, post-tibiæ swollen medianly where there are a few long whitish hairs on outer surface; flexor margin sinuate; apical and basal joints of post-tarsi in proportion 1:2. Wings brownish with brown stigma (Fig. 158). Length, 4.4 mm.; wings, 6.25 mm.

♀. Similar. Front entirely silvery except shining spot at vertex;

occiput very much swollen and puffed out (Fig. 124), entirely and densely cinereous, Mesonotum and scutellum cinereous or brownish, especially the former. Abdomen entirely cinereous with a median brown stripe, or dorsum of segments 2–6 subshining, brownish tinged, becoming opake at bases; a lateral comb of white hairs on first; sixth longer than fifth. Ovipositor yellow, abruptly terminating and longer than its black cinereous base, slightly curved down, extending to apex of first segment (Fig, 56). Tibiæ entirely yellow or annulated; femoral spines distinct apically. Wings hyaline (Fig. 159). Length, 3.8 to 4.5 mm.; wings, 5.0 to 5.6 mm.

Type.—♂. Manchester, Vt., June 6, 1910 (Fig. 158. *Johnson, B. S. N. H.*).

Paratypes.—Mt. Equinox, Vt., June (3 ♀s, Figs. 56, 124, 159, *Johnson, B. S. N. H.*); Sea Cliff, Long Island (1 ♀, *coll. Banks*).

This species differs from *elegantulus* Will., according to the description, in having the antennæ acuminate instead of obtusely pointed; the mesonotum is not distinctly pilose, in fact, it has at most only very fine pubescence; the third section of fourth vein is not over twice as long as second. The females may be distinguished at once, among those with fourth vein appendiculated, by having the occiput unusually swollen which gives the head a cubical appearance (Fig. 124).

19. **P. acuminatus** n. sp.

♀. Front silvery, shining black at vertex. Face silvery. Antennæ with second joint black, third yellow and long white acuminate (Fig. 26). Thorax entirely grayish pollinose, mesonotum less so in the middle, bare except for a few whitish hairs along lateral margins; scutellum convex, grayish, with minute whitish marginal hairs. Abdomen opake, grayish pollinose with bases of 3–5 segments broadly brown, which color extends more apically in the middle; sixth segment more shining. Ovipositor yellow, extending to apex of first ventral segment, slightly curved downwards; its long conical base shining black (Fig. 77). Coxæ and femora black, grayish; all joints, tibiæ excepting the brown annuli, and all tarsi yellow; fore femora with two series of about three, and the middle femora with about six minute black flexor bristles; hind femora with flexor series of about four bristles. Wings hyaline (Fig. 155), with colored stigma. Length, 3.5–4.0 mm.; wings, 3.7–4.4 mm.

Type.—Alamogordo, New Mexico, May 12, 1902 (Figs. 26, 77, 155, *Viereck, A. N. S.*, No. 5025).

Paratypes.—Two specimens from the same locality, taken in April and May.

Three specimens examined. This may be the female of the Mexican *P. elegantulus* of Williston, but hardly likely. The antennæ are not entirely black and are long acuminate, and the abdomen is opake.

20. **P. mainensis** n. sp.

♂. Front and face silvery: occiput black or grayish tinged; mouth parts yellow. Antennæ black, long acute, whitish apically (Fig. 6). Mesonotum and scutellum subopake, brownish; laterally, pleuræ and metanotum, especially the latter, cinereous. Scutellum with minute marginal bristles. Humeri black; halteres yellow. Abdomen moderately slender, widest at third segment; first with two silvery white spots; narrow lateral angles, and ventral margins of 2–4 cinereous; base of first, entire 2–3, broad of fourth, and narrow bases of fifth, opake-black; leaving apex of fourth and remainder of fifth polished; the latter with two small dorsal indentations, and twice as long as fourth; first with distinct lateral comb of black bristles. Hypopygium very small, more opake, brownish tinged and cleft, Coxæ and the distinctly marked femoral rings black (Fig. 126), otherwise yellow; femora moderately stout, distinctly spinose; middle pair with posterior series of yellow hairs; apical and basal post-tarsal joints in proportion 1:3; post-tibiæ with few long hairs on outer surface at middle. Wings grayish or brownish (Fig. 150). Length, 4.4 mm.; wings, 5.0–6.0 mm.

♀. Similar. Front entirely silvery; antennæ acuminate (Fig. 7), yellow or brownish. Only the median portion of mesonotum brown; scutellum with stronger marginal bristles. First and second segments entirely, narrow apices, and broad lateral margins of 3 and 4 cinereous; otherwise 3 and 4 opake-black; 5th and 6th shining. Ovipositor short, yellow, unusually thickened at its articulation with the large shining black globose base (Fig. 89). Femoral rings less distinct than in male. Length, 4.0 mm.; wings, 4.4 mm.

Type.—♂. Fort Kent, Maine, August 17, 1910 (Figs. 6, 126, 150, *Johnson, B. S. N. H.*).

Paratype.—One female (Figs. 7, 89, 151) from the same locality.

The peculiarly formed ovipositor which seems to be articulated with its large globose base, and the entirely cinereous first and second segments are very distinctive, as are also the fine scutellar bristles.

21. **P. cingulatus** Loew.

Dr. Hough in his paper (1899 Hough) page 81, is rather confusing. In the table of species, section 1, he gives the "abdomen shining black or bronze, with *opake-black* fascia or spots on *cephalic* borders of the segments," in other words, the segments have velvety black bases. This leads to the species *cingulatus* and *fuscus*. In the description of the former he says, "abdomen black, shining, with white pollinose sides, each segment with a slender *basal*, *dark cinereous* pollinose fascia." This seems to suggest a subopake, brownish and faintly gray pollinose condition. However, since he again, in section 5 of the table, mentions that the segments have "opake-black at their cephalic borders," it is very probable that such is the case; so I am considering this species to have the abdomen shining black, with first segment apically and the following ones laterally cinereous, the bases of 2–5 opake velvety black, and the tibiæ nearly black with basal third and extreme apices yellowish.

The specimens before me I consider belonging here, although the abdominal markings and coloration agree exactly as described by Dr. Hough under *fuscus* Lw. However, on account of their dark tibiæ, and of the fact that the two species probably have similar abdominal characters, I have placed such forms under this species.

♂. Black. Front brown, face yellowish-white, and occiput white pollinose. Antennæ (Fig. 17), black, broadly acute, sometimes with whitish spinose apices. Proboscis yellow; palpi brownish. Mesonotum and scutellum more or less shining, black or faintly brownish with short brown pile. Pleuræ and metanotum faintly cinereous; humeri black and halteres with yellow knobs. Abdomen subcylindrical, segments 2–4 subequal; fifth longer, rather quadrate, with two faint dorsal indentations; clothed with scattered white pile, which is more distinct laterally; apices of segments 2–5 to greater or less extent, polished and tinged with bronze lustre; their bases opake, velvety brownish-black, which is sometimes attenuating laterally, or, in variety *velutinus*, the abdomen is entirely opake; first segment more or less cinereous, sometimes with two white spots, becoming more velvety black basally; also the apex of second faintly, and extreme ventral margins, cinereous; hypopygium subopake, faintly cinereous, very assymetrical, strongly compressed to right and cleft, in which there is

a sharp, prominent, vertical keel; intermediate and ventral lobes hardly visible (Figs. 67–68). Legs black, clothed sparsely with white pile; coxæ generally, extreme bases and apices of femora, broad bases and sometimes broad apices of tibiæ, anterior pair often entirely, more or less of basal tarsal joints, and pulvilli, yellow. The legs are sometimes nearly entirely black, the yellowish parts being so very obscure as to be hardly noticeable; all femora have the usual flexor spines. Wings grayish hyaline, or of a brownish tinge (Fig. 174). Length, 3.5–5.0 mm.; wings, 4.5–5.6 mm.

♀. Unknown.

Described from District of Columbia; also reported from New Hampshire (1896 Slosson 263). Before me are specimens from the following localities: Cottage Beaulieu, Beaulieu, Quebec (1, *Beaulieu, coll. Johnson*); Mt. Ascutney, Vt., 1; Norwich, Vt., 1; Montpelier, Vt., 1; Auburndale, Mass., 2, Figs. 17, 67, 68, 174; Hanover, N. H., 2 (all by *Johnson, B. S. N. H.*); Ithaca, N. Y. (1, *coll. Johnson*; 2, *coll. Banks*); Harrisburg, Pa. (1, *Walton, coll. Banks*); Swarthmore, Pa. (*Cresson, A. N. S.*); Manayunk, Pa. (2, *Johnson, A. N. S.*); Black Mountains, N. C. (1, Figs 69–70, *coll. Banks*). Taken May to September.

This species is readily distinguished by the non-cinereous abdomen, with bases of segments opake, and their apices polished, having large, very assymetrical hypopygium.

Before me is also a specimen from Glencarlyn, Va. (*coll. Banks*), which is smaller than usual, and the abdomen and legs are not all pilose, but otherwise typical.

The variety *velutinus* n. var., Swarthmore, Pa., June 19, 1910 (*Cresson, A. N. S.*, Type No. 5026), has no tinge of gray anywhere except on the head; is more robust than the typical form, but most distinct in having the abdomen entirely opake, velvety brown; the hypopygium is also more developed. I at first thought it a new species, but receiving a specimen from the Black Mountains, N. C. (Figs. 69–70, *coll. Banks*), having the apices of the segments polished, although agreeing with the type in other respects, I reduced it to variatal rank. I have also another specimen from Glenside, Pa. (Fig. 71, *coll. Johnson*), agreeing with the type.

22. **P. fuscus** Loew.

This species I do not know. It seems to be, in every respect, similar to *cingulatus* Lw., except in the coloration of the tibiæ, which in this species are yellow, at most only discolored with faint brown rings. If this is the only character of differentiation, it seems probable that it is synonymous; but more material is needed for study to ascertain this. If such synonymy is established, then the form here described, being distinctly different in other respects from *cingulatus* Lw., may be a new or extreme form.

♂. Front, face and occiput white. Antennæ acute, brown; arista black (Fig. 33). Mesonotum subopake, densely brown pollinose, with whitish pubescence. Scutellum shining black; pleura and metanotum cinereous; humeri and halteres yellow. Abdomen subcylindrical, nearly as long as head and thorax together, shining black, but not noticeably bronze tinged, first segment cinereous apically, bases of following segments narrowly velvety black, lateral apical angles of segments 2–5 cinereous, and a faint median transverse brownish-gray fascia on segments 2–3; segments 1–4 subequal in length, 5th longer, subquadrate, with two dorsal indentations; hypopygium subopake, brownish, much developed, extending to apex of third ventral segment, assymetrical (Fig. 75), strongly compressed to right, with distinct cleft, which becomes an opake circular area above; a sharp vertical keel protrudes from apex; intermediate and ventral lobes small, black; entire abdomen sparsely clothed with yellow pile. Legs yellow, coxæ, femora, excepting bases and apices, black; tibiæ with faint brownish median rings; all femora very stout apically, with usual flexor spines; post-tibiæ strongly bent. Wings (Fig. 156) brownish, highly iridescent. Length, 5.0 mm.; wings; 6.25 mm.

Lehigh Gap, Pa., VI. 25 '01. (*Coll. C. W. Johnson.*)

It will be noticed that the grays and yellows are more pronounced in this form than in those placed under *cingulatus* Lw.

Dr. Hough (1899 Hough 78) suspects that *reipublicæ* Walker, is the same as this species, and I cannot do better than treat it as such in this paper.

23. **P. viduus** n. sp.

♂. In general appearance similar to *femoratus*. Front, face and occiput white. Palpi, proboscis and antennæ (Fig. 8) black or brown, latter acute. Thorax subshining; mesonotum brown pollinose, white pilose; lateral margins, pleuræ and metanotum, cinereous.

Scutellum more shining, cinereous at base. Humeri and halteres yellow. Abdomen shining, except first and lateral angles of following segments cinereous; fifth segment longer than fourth, with two dorsal indentations. Hypopygium subopake, entirely faintly cinereous, well developed (Figs. 84–85), extending to apex of fourth ventral segment, strongly compressed to right, with distinct cleft and a strong vertical keel at apex; intermediate and ventral lobes small, black. Legs black, trochanters, bases and apices of femora, all tibiæ, except more or less distinct median rings, especially posterior pair, bases of tarsi and pulvilli, yellow. All femora slender and post-tibiæ slightly bent. Wings strongly brownish tinged (Fig. 142). Length, 4.4–5.0 mm.; wings, 5.0–5.7 mm.

Type.—Burlington, Vt., June 24, '06 (Fig. 142, *Johnson, B. S. N. H.*);

Paratype.—One specimen from Mt. Graybeard, N. C., May (Figs. 8, 84, 85, 143, *coll. Banks*).

These specimens, in general appearance, resemble one from Lehigh Gap which I have placed under *fuscus* Lw., but this has the lateral margins of mesonotum cinereous; abdomen showing no sign of opake fasciæ; femora much more slender, with post-tibiæ hardly bent, and all tibiæ darker; the wings more intensely brown. On comparision it is at once seen that the two are distinct. From general appearance one might be lead to suppose this to be the male of *horvathi*, Kert. The paratype differs somewhat in the proportion of the stigma and following section (Fig. 143), but otherwise seems to be indentical.

24. **P. femoratus** n. sp.

♂. Antennæ, proboscis, palpi, humeri, halteres and legs yellow. Front, occiput, and face white; antennæ conically acute (Fig. 10); arista black. Thorax subopake, naked. Mesonotum yellowish-brown pollinose medianly, with margins, pleuræ and metanotum cinereous; a shining area on mesopleuræ. Scutellum shining. Abdomen subcylindrical, as long as head and thorax together; segments 1–4 subequal, fifth longer, quadrate, with two dorsal indentations; very sparingly short pilose or naked; shining, except first and lateral angles of following, cinereous, which color extends obliquely mesad on dorsum of segments 2–4, margining opake-black lateral spots at the bases of these segments; this design becoming more obsolete on each succeeding segment; a narrow median shining line is distinguished where this design tends to coalese on dorsum. Hypopygium less shining, faintly cinereous, well developed (Fig. 92), extending to apex of third ventral

segment, very assymetrical, strongly compressed to right with distinct cleft and a little developed vertical keel at apex; intermediate and ventral lobes small and black. Coxæ black; femora yellow, stout; apical half of posterior pair strongly incrassate (Fig. 121) where they are generally discolored with brown, their flexor surfaces very sinuate; all bearing the usual series of spines apically, which are very distinct; middle femora with posterior series of yellow hairs which become minute black bristles apically; post-tibia strongly bent at apical third; apical and basal post-tarsal joints in proportion 1:3.5, Wings faintly tinged with brown, with colored stigma (Fig. 157). Length, 4.4–5.0 mm.; wings, 5.5–6.3 mm.

♀. Similar. Front white; ocellar tubercle shining black. Thorax cinereous; mesonotum somewhat shining, brown pollinose medianly, sparingly pubescent. Abdomen with lateral apical margins of 2–5 faintly and narrowly yellowish. Ovipositor yellow, short and stout, reaching third ventral segment (Fig. 93), gradually tapering from its elongate shining black base. Tibiæ dilated apically, especially posterior pair which are rather distinctly bent; post-tarsi nearly equalling tibiæ, serrate with basal joint hardly more than twice as long as wide; apical joint of all tarsi blackish. Colored stigma longer than third section.

Type.—♂. Mt. Ascutney, Vt., July 11, '08, 2000 ft. alt. (Figs. 10, 92, 121, 157, *Johnson, B. S. N. H.*).

Paratypes.—Mt. Ascutney, Vt., 1 ♂; Brookline, Mass., 1 ♂; Freetown, Mass., 1 ♀, Fig. 93 (all by *Johnson, B. S. N. H.*); Ithaca, N. Y. (2 ♂s, *coll. Banks*). Taken in July.

May be distinguished from its allies by the thickened femora and yellow legs.

25. **P. brevis** n. sp.

♀. Front and face silvery, only extreme vertex shining; occiput white; second antennal joint brown, third yellow, long white acuminate (Fig. 37). Mesonotum subopake, brownish medianly, cinereous laterally, Scutellum not shining, brownish-black, without hairs; humeri black, halteres yellowish, apex of knobs brown. Pleuræ and metanotum cinereous. Abdomen shining to subopake, grayish tinge at apices of segments; apical margin of first broadly white and broadly interrupted medianly; entire lateral margins of second and apical lateral angles of following segments, cinereous; fifth segment longer than sixth. Ovipositor yellow, gradually tapering from the elongo-globose, cinereous base, straight or slightly curved down (Fig. 79), extending to base of second ventral segment. Legs yellow, coxæ, broad median rings on femora, and apical tarsal joints blackish; inner surface of post-femora polished; post-tibiæ normal; apical and basal

joints of post-tarsi in proportion 1:2; femoral spines distinct apically. Wings short hyaline, with colored stigma (Fig. 137). Length, 3.5 mm.; wings, 4.0 mm.

Type.—Norwich, Vt., July 8, '08 (*Johnson, B. S. N. H.*).

Similar to *acuminatus*, but less shining; front more silvery; longer fifth abdominal segment, and fifth costal section equalling third and fourth together. It is at once distinguished from *appendiculatus* by the normal occiput.

26. **P. nitidiventris** Loew.

Described from the District of Columbia; also reported from New Hampshire (1895 Slosson 320) and Canada (1901 Chagnon 13).

I do not know this species, which seems to consist of all females. None of the specimens examined in the material at hand seem to fall under this form, except those I have placed in the following species, *horvathi* Kert. Both these forms may be distinguished from among the females by the black (?) humeri, the shining abdomen and the black femora. Neither Loew or Hough gives the color of the humeri, which I suspect are black.

27. **P. horvathi** Kertesz.

Described from New York. I have before me the following specimens which seem to be this species, but are possibly distinct, and are all females: Norwich, Vt., 2; Boston, Mass., 1 (both by *Johnson, B. S. N. H.*); Swarthmore, Pa., 2, Figs. 21, 78, 162 (*Cresson, A. N. S.*), Taken May to September. They differ from *nitidiventris* Loew, in the absence of the pollinose stripe on the third segment, and in having distinct femoral spines. The following description is based upon the above specimens:

♀. Face and lower part of front silvery, upper part of latter shining with fine median groove; occiput cinereous. Antennæ black, acute (Fig. 21). Mesonotum opake or subopake, cinereous or brownish; scutellum more shining; pleuræ and metanotum cinereous tinged; humeri black; halteres yellow. Abdomen polished or shining, with only first and lateral margins of following segments cinereous; each increasing in length. Ovipositor yellow, gradually tapering from, and hardly longer than its shining black elongate base; extending to apex of second (Fig. 78). Legs black with knees, bases and apices of

tibiæ and basal joints of tarsi yellow; only inner surfaces of post-femora polished; femoral spines distinct; posterior surface of middle femora with more or less developed series of yellowish hairs; apical and basal post-tarsal joints in proportion of 1:2. Wings hyaline (Fig. 162). Length, 3.5 to 4.0 mm.

28. **P. angus** n. sp.

♀. Similar to *sororius* but smaller. Front broader than face, shining, but silvery below; antennæ black, long acute, or short acuminate. Ovipositor short, stout, abruptly terminating, and equalling its large subglobose base (Figs. 94–95). Legs dark, similar to those of *alpinus*. Length, 3.5 mm.; wings, 5.5 mm.

Type.—Cloudcroft, N. M., June 20, '02 (*Viereck, A. N. S.*). Type No. 5033.

A specimen from St. Johnsbury, Vt., June (Figs. 95, 172, *Johnson, B. S. N. H.*), seems to be very near this species, but is larger (4.0 mm.) and front entirely cinereous (antennæ wanting). More material is wanting to fix this species more clearly, but the stout ovipositor with its large base is very different from the other allied forms. The broad shining front of the typical specimen is also very characteristic.

29. **P. sororius** n. sp.

♀. Front and face silvery, only the ocellar region shining; occiput cinereous. Antennæ black or brown, short acuminate (Fig. 16). Mesonotum subopake, cinereous, brownish medianly, rather distinctly white pilose; scutellum more shining; pleuræ and metanotum cinereous; humeri and halteres yellow. Abdomen polished, but first generally, narrow apical margins, lateral angles and ventral margins of following segments, cinereous; lateral apical margins of latter of yellow ground color; all segments increasing in length. Ovipositor yellow, stout, gradually tapering from, and slightly longer than its elongate-subglobose, shining black base; extending to apex of second segment; straight or slightly curved down (Fig. 87). Legs yellow with coxæ and broad femoral rings black; femora moderately stout, with one surface polished, strongly spinose; middle pair with posterior series of yellow hairs; apical and basal post-tarsal joints in proportion 1:2.5; claws much longer than joint. Wings more or less brownish (Fig. 146). Length, 4.5 to 5.6 mm.; wings, 5.3 to 6.4 mm.

Type.—Brattleboro, Vt., July 15, '08 (Figs. 16, 87, 146, *Johnson, B. S. N. H.*).

Paratypes.—Penobscot Co., Me. (1, *Cushman, B. S. N. H.*); Kingston, R. I. (1, *Barlow, B. S. N. H.*); New York, 1;

Ithaca, N. Y., 1; Sea Cliff, L. I., 1; Falls Church, Va., 2 (all *coll. Banks*). Taken June to August.

A rather robust species, distinguished by its black antennæ, yellow humeri and halteres, shining abdomen and yellow legs with black banded femora. A specimen from Amsden, Vt. (*Johnson, B. S. N. H.*), is very similar, but the ovipositor is abruptly terminating the base (Fig. 88), and the middle femora are without the yellow hairs. Wings as in Fig. 147.

30. **P. alpinus** n. sp.

♀. Similar to *sororius*, but smaller. Antennæ more finely acuminate (Fig. 14). Femora black, except bases and apices; tibiæ and tarsi dirty yellow, former more or less tinged with brown. Ovipositor much longer and slender, curved down, extending to base of abdomen, abruptly terminating its elongate base, which has a more or less developed tubercle above next to venter of abdomen (Fig. 86). Length, 3.7 to 4.5 mm.; wings (Fig. 170), 4.2 to 5.0 mm.

Type.—Mt. Equinox, Vt., June 5, '10 (Figs. 14, 86, 170, *Johnson, B. S. N. H.*).

Paratypes.—Mt. Ascutney, Vt. (1, *Johnson, B. S. N. H.*); Mt. Washington, N. H. (1, *Slosson, B. S. N. H.*). Taken June to July.

Although closely related to *sororius* in general form and color, it is distinctly separated by the form of the ovipositor.

31. **P. constrictus** Banks, n. sp.

"♂. Face and front silvery pollinose; antennæ black, third joint only short pointed below, arista swollen at base (Fig. 32); occiput silvery pollinose on sides, dull black above; thorax dull brown-black above, humeri yellow, pleuræ silvery pollinose; poisers slightly brownish on the tips; abdomen shining black, punctate, with fine short hairs above, lower sides gray-pollinose, it is rather slender, the sides subparallel, and the segments narrowed at base and tip, so that they have a constricted appearance, hypopygium small, with a broad apical slit, slightly to the right side; legs pale yellowish, tips of tarsi blackish, a short blackish mark on upper anterior middle of front femora, and on lower anterior middle of middle femora, hind tibia only slightly curved. Wings hyaline (Fig. 178), stigma long, brown, veins blackish, except at base, small cross-vein at end of basal third of cell, but plainly beyond end of auxillary vein, the fourth longitudinal has an appendix at end of basal fourth beyond end of cell, it

reaches only one-third way to margin. Length, 5.0 mm.; wings, 5.5 mm."

Type.—Black Mountain, N. C.; North Fork Swannanoa, May (*coll. Banks*).

I submit the following: Metanotum hardly grayish; scutellum black, subopake; the short hairs of abdomen white; the abdominal punctures very fine and in some parts are not perceptible; lateral and ventral margins of all segments densely cinereous; fifth segment longer than fourth; hypopygium (Fig. 76) as long as fourth and about half as broad as fifth, brownish tinged; intermediate lobe narrowly visible; ventral lobe yellowish; middle femora with a short series of black spines on posterior surface near apex, and a similar series is also discernable on the fore femora, otherwise the femora are strongly spinose below; post tibiæ with 2–3 long black hairs outside at middle; apical and basal tarsal joints in proportion of 1 : 3; wings have a slight brownish tinge; stigma equalling fourth section.

This species is very near *elegantulus* Williston, from Mexico. The only difference seems to be in the non-pilosity of the mesonotum and the lighter femora. The basal and apical constriction of the abdominal segments in this species is very noticeable, as are also the posterior series of spines on the middle femora.

32. **P. luteicornis** n. sp.

♀. Front, face and occiput white; vertex with only ocellar tubercle shining black. Antennæ, proboscis and palpi yellow; second joint of former brown; third acute (Fig. 20), arista black. Thorax cinereous, mesonotum more shining, brown pollinose medianly, short pubescent. Scutellum shining; humeri and halteres yellow. Abdomen subcylindrical, but broadest at fifth segment; all segments subequal in length, shining, except first and lateral angles of following cinereous; lateral apical margins of 2–5 with faint yellow tinge. Ovipositor yellow, moderately slender, extending to second ventral segment, straight or slightly curved down, somewhat longer than its elongo-globose, shining black base (Fig. 116). Legs yellow, except coxæ and broad femoral ring, black, the line of demarcation between yellow and black very pronounced (Fig. 122); one surface of femora polished; flexor spines distinct. Wings grayish tinged, with colored stigma (Fig. 173). Length, 3.8 mm.; wings, 3.8 mm.

One female. Machias, Me. July 20, '07 (*Johnson, B. S. N. H.*).

Closely allied to the *nitidiventris*-group, but differing in having the antennæ yellow.

33. **P. houghi** Kertesz=*lateralis* || Walker.

♂. Front and face and occiput, white. Palpi, proboscis and third joint of antennæ yellow, latter acute and white pilose (Fig. 25); arista black. Mesonotum shining, more or less obscured by thin brown pollen, not pilose. Scutellum subopake, concolorous. Pleuræ and metanotum less shining, lightly cinereous. Halteres and humeri yellow. Abdomen subcylindrical, somewhat flattened, segments 2–4 subequal, fifth longer, with two indentations on dorsum; entirely black, or yellowish laterally, shining except the first segment, which is cinereous; venter black, or yellowish. Hypopygium little developed, more or less assymetrical (one of the specimens has it compressed to the right, the other not noticeably so); cleft distinct, without keel (Fig. 82); intermediate lobe visible from above; ventral lobe small, brownish. Legs entirely yellow, but bases of coxæ and apices of tarsi brownish; femora slender; post-tibiæ dilated and slightly bent. Wings grayish (Fig. 179), with colored stigma. Length, 4.4 to 5.9 mm.; wings, 5.6 to 6.3 mm.

♀. Front shining at vertex. Base of ovipositor globose, hardly longer than fifth segment; ovipositor stout, yellow, and very short, about three-fourths as long as its base (Fig. 83). The basal joint of posttarsi distinctly flattened or compressed, also the following joints to some extent, and extending in form of teeth apically, giving strong serrations; the margins as well as the under surfaces, and the apical mesal surface of the tibiæ, distinctly scopate.

Described from North America; also reported from Florida (1896 Johnson 331). Before me are the following, which I consider as belonging to this species: Burlington, Vt. (1 ♀, Figs. 24, 83); Auburndale, Mass. 1 ♂ (both by *Johnson, B. S. N. H.*); Ithaca, N. Y. (1 ♀, *coll. Banks*); Roxborough, Pa. (1 ♂, Figs. 25, 82, 179, *Greene, A. N. S.*); North Mt., Pa. (1 ♂, *coll. Johnson*). Swarthmore, Pa. (1 ♂, *Cresson, A. N. S.*); Bay Ridge, Md. (1 ♂, *coll. Banks*). Taken April to August.

This species is readily distinguished by its entirely shining abdomen, and slender yellow legs. I cannot separate *pallipes* Johnson, from this species, except in its smaller size (3.5 mm.). The above forms, with yellowish tinge on sides of abdomen, seem to be only varieties of this species.

34. **P. varius** n. sp.

♂. Similar to *tarsalis*. Front brownish; face silvery or with yellow tinge, occiput faintly grayish to brownish. Antennæ with third joint yellow, short, acute (Fig. 19). Mesonotum and scutellum somewhat shining, brownish tinged; pleuræ and metanotum hardly tinged with gray; humeri black and halteres brown or yellowish. Abdomen ovate, polished, with two white spots on first segment; fifth about one and one-half as long as fourth. Hypopygium subopake, brownish, little shorter than fifth and much narrower, assymetrical, and cleft; intermediate lobe just visible; ventral lobe black (Fig. 63). Legs slender, pale yellow, with black femoral rings; distinctly spinose; apical and basal post-tarsal joints in proportion 1:2; claws smaller than joint. Wings gray or brownish with faintly colored stigma (Figs. 148–149). Length, 3.2 mm.; wings, 3.8 mm.

Type.—Harrisburg, Pa., August 8 (Figs. 19, 63, 148, *Walton, coll. Banks*).

Paratype.—One specimen from same locality (Fig. 149).

The similarity between this species and *tarsalis* is evident, but the black humeri, short antennæ and lighter legs will distinguish this one.

35. **P. tarsalis** Banks, n. sp.

"♂. In the second group with dark stigma, and shining abdomen, but the last joint of antennæ is elongate, acute, and white. The face is silvery, also occiput; the arista of antennæ is very distinctly swollen at base; the thorax black, with yellowish humeri; the abdomen is short and broad, shining black, the first segment hoary; the legs are black, the apex of femur, basal part of tibia and part of tarsus pale, the basal joint of tarsus is brownish, and last joint black, the claws are very short. The wings are gray [Fig. 165], the veins and stigma black; the small cross-vein is before end of first third of cell, but as far out as end of auxillary vein; the third and fourth longitudinal veins are farther apart at tip than usual. The last segment of male abdomen is small, and with slight cleft on right side; the fourth ventral segment has a conical process at tip. Length, 3.0 mm.; wings, 3.5 mm."

Type.—Ithaca N. Y., July (*coll. Banks*).

I make the following observations: Front silvery; antennal third joint yellow, long white acuminate (Fig. 9). Mesonotum and scutellum subopake; halteres with black knobs; pleuræ, metanotum, and ventral margins of abdomen tinged with gray. All segments subequal in length; hypopygium small, subopake, as long as fifth segment, and much narrower; terminal lobe seems to be without cleft, but has

a rupture-like depression at base on right side; intermediate lobe visible at sides; ventral lobe small. Legs slender; apical and basal post-tarsal joints in proportion of 1 : 3.5; claws shorter than apical joint. Stigma with only apical part colored. The conical process of the fourth ventral segment is white and somewhat globular. I think it is an effect of some injury. The claws are unusually short in this species. The hypopygium may be considered cleft or not, perhaps depending upon the amount of development. The stigma is partly colored, the basal half at least hyaline.

Group III.

Stigma hyaline and generally very small.

36. **P. albofasciatus** Hough.

♂. Front and face silvery or the former yellowish; occiput cinereous or brownish. Antennæ black, long acuminate (Fig. 42), more or less sericeous. Mesonotum subopake, brownish; scutellum more shining; pleuræ and metanotum cinereous, the latter densely so. Humeri yellow; halteres black or brown. Abdomen broad, subopake, brownish, with apex of first, ventral margins of following, and large lateral, more or less coalesing spots on fifth segments, cinereous; fifth longer than fourth. Hypopygium slightly more shining, large, symmetrical, longer than, and as broad as, fifth, semi-circular from dorsal aspect; *cleft on left side* (Figs. 96–97); intermediate and ventral lobes just visible from above. Legs black, with apices of femora, broad apices and bases of tibiæ, and most all tarsi, yellow; spines minute; claws about as long as joint, which is about one-third as long as basal joint. Wings small, nearly hyaline (Fig. 188). Length, 4.0 mm.; wings, 4.3 mm.

♀. Similar. Front entirely shining, or, silvery at antennæ, sixth abdominal segment also with two cinereous spots; all segments subequal in length, except sixth a little longer. Ovipositor very slender (Fig. 98), rufous, extending to apex of second, rather abruptly terminating its black retracted base; basal joint of tarsi somewhat shorter. Wings hyaline (Fig. 189).

Described from Louisiana; also reported from New Jersey (1899 Smith 665). Before me are the following which I consider belong here: Burlington, Vt., 1 ♂ (Figs. 42, 188); Waltham, Mass., 1 ♂ (Figs. 96–97); Hampden, Me., 1 ♀ (Figs. 98, 189) (all by *Johnson*, *B. S. N. H.*); Woburn, Mass. (1 ♀, *Barlow*, *B. S. N. H.*). Taken June and July.

This is the first case I have seen where the hypopygium is cleft on the left side. Hough says there is no cleft, but I cannot think these specimens are otherwise than this species, as they are very distinct in the markings of the abdomen. The females undoubtedly belong to the same species.

37. **P. flavomaculatus** Hough.

♂. Front shining; face silvery; eyes narrowly separated; occiput brown or grayish, much more swollen above. Antennæ brown, long acuminate (Fig. 23); mouth parts yellow. Mesonotum subopake, brownish; scutellum black; pleuræ and metanotum hardly tinged with gray; humeri black; halteres yellow. Abdomen long and slender, shining, with only first segment cinereous; lateral margins of 2–4 more or less broadly yellow; otherwise black; fifth larger, longer than fourth with two dorsal indentations. Hypopygium shining black, as long as, and nearly as broad as, fifth, triangular, assymetrical, with cleft (Figs. 100–101); intermediate and ventral lobes small, black. Legs slender, entirely yellow, even apices of tarsi; without spines; apical and basal post-tarsal joints in proportion of 1:3.5. Wings nearly hyaline (Fig. 184). Length and wings 4.4 mm.

♀. Similar. Front shining black, with lower portion silvery; antennæ (similar in shape to Fig. 22) brownish-black, with third joint long, whitish acuminate. Mesonotum and scutellum brown pollinose; pleuræ and metanotum faintly grayish; halteres yellow. Abdomen shining black, with faint hoary aspect; first segment with a lateral comb of four to five long brownish bristles. Ovipositor yellow, a little shorter than its conical yellow base, stout and straight, hardly extending as far as the third segment, and is abruptly thickened at its junction with the base (Fig. 102). Femora more or less discolored basally, subopake, with no distinct shining surfaces. Wings hyaline (Fig. 185). Length and wings 4 mm.

Described from Massachusetts. Before me are the following, which I consider belong to this species: Highspire, Pa., April (1 ♂, *coll. Banks*, Figs. 23, 100–101, 184); Brookline, Mass. (1 ♀, *Johnson*, *B. S. N. H.*, Fig. 102); Hampton, N. H. (1 ♀, *Shaw*, *B. S. N. H.*, Fig. 185); both taken in May.

It seems to me that these specimens without doubt belong to this species, although Hough describes the hypopygium without cleft, while this one has an opake hollow at apex. This species is not to be confused with *houghii* Kert., which has the stigma colored. The females are, in general form, very similar to the males, in having the long slender abdomens which are somewhat smaller basally than at apices.

I have also a female from Cloudcroft, N. M., May (*Viereck, A. N. S.*; Figs. 22, 186), which is very similar, but the legs are mostly black with the apices of femora, apices and bases of tibiæ and tarsi, brownish-yellow. This may be a distinct species.

38. **P. atramontensis** Banks, n. sp.

"♂. Face black, silvery pollinose; antennæ pale yellowish, last joint long pointed below [Fig. 38], base of arista swollen, sides of occiput silvery pollinose, thorax dull black; abdomen moderately slender, slightly widened at third segment, shining black, with some scattered gray hairs, base gray-pollinose, hypopygium rather small; poisers pale yellow; legs pale yellow, a prominent black spot at base of all the femora [Fig. 127], largest on the hind femora, hind tibia slightly curved; all tibiæ and tarsi with minute black teeth above and below. Wings [Fig. 190] gray, veins black, except at extreme base, where they are yellowish, small cross-veins at end of basal fifth of cell and before tip of auxillary vein, stigma barely darkened. Length, 5.0 mm.; wings, 5.6 mm."

Type.—North fork of the Swannanoa River, Black Mountain, N. C. (*coll. Banks*). Taken in latter part of May.

Paratype.—One specimen from same locality.

The small prominent black spot at base of femora readily distinguish this from every other species known in our fauna.

I submit the following observations: Front also silvery on lower part, shining above, narrowly separating the eyes; mesonotum and scutellum brownish tinged; humeri black; pleuræ and metanotum hardly tinged with gray; abdomen long, and not at all grayish; segments subequal in length or fifth little longer with two dorsal indentations; hypopygium shorter than fifth, compressed to right, without cleft (Fig. 119), intermediate lobe visible; ventral lobe yellow; legs slender; apical and basal post-tarsal joints in proportion of of 1:4; stigma hyaline. In general form of the abdomen this species resembles *flavomaculatus* Hough.

39. **P. xanthopodus** Williston.

♂. Front and face silvery; antennæ with second joint blackish, and third yellow, acutely pointed. Mesonotum brown; pleuræ and metanotum silvery-gray. Abdomen shining black; lateral margins in part yellowish; first and second segments entirely, and the successively narrower sides of 3–5 gray, opake. Legs yellow; femora stout, and

spines distinct. Wings nearly hyaline; third section of fourth vein three times second. Length, 5.0 mm.; wings, 7.0 mm.

Described from Mexico. I have not seen this species.

40. **P. flavicornis** Williston.

♀. Front and face silvery, the former towards vertex shining, very narrow and unusually converging above; antennæ yellow, with third joint obtusely pointed, ovate. Mesonotum dark brown; pleuræ silvery. Abdomen opake, coffee-brown; first segment gray; 2–6 broadly opake; silvery-gray laterally, with more brownish interrupted apical bands. Ovipositor yellowish. Legs yellow, including coxæ; spines conspicuous; apex of tarsi blackish. Wings nearly hyaline. Length, 5.0 mm.; wings, 6.0 mm.

Described from Mexico; the male is also reported from Mexico (1893 Giglio-Toss 71). I have not seen this species.

41. **P. willistoni** Kertesz, *aculeatus* || Will.

♀. Front black, lightly pollinose; face densely silvery; third antennal joint light yellow, long acuminate. Mesonotum brownish pollinose. Abdomen shining black; first segment and lateral margins of following cinereous, ovipositor reddish. Legs light yellow, without femoral spines. Wings nearly hyaline; third section of fourth vein more than twice second. Length, 3.0 mm.; wings, 4.0 mm.

Described from Mexico; also reported from the West Indies (1896 Williston 351). I do not know the species.

Subvirescens-group.

I have designated by this name a group of several forms, one of which is supposed to be *subvirescens* Loew. These forms agrees with the typical description of that species in general, but are easily separated from each other by characters not given in such description. The females are more difficult to separate than the males. In fact it is sometimes impossible from the present knowledge of the group and from the limited amount of material, to give any satisfatory characters for their separation. The minute, bristle-like hairs near the bases of the femora and trochanters beneath, and also the processes on the latter, are characters which need investigating, and will no doubt throw much light on the classification of this group. Great care is required, and a compound microscope, in the satisfactory examination for these characters, especially the minute hairs. The sculptur-

ing of the abdomen, in some species, can be distinguished only under a magnification of about 60–70 diameters. The black hairs on the abdomen seem to vary considerably in density, size, and inclination, and although they may prove to be of some importance, I have not given them much attention here. No doubt *politus* Williston, belongs in this group, but the description is inadequate for closer determination.

42. **P. subvirescens** Loew.

Dr. Hough redescribes this species from Loew's type as follows :

Front of male very small, silvery pollinose, without depression; eyes in contact. Thorax and scutellum shining greenish-black, dusted with brown pollen in the middle and towards the cephalic border; humeri yellow; halteres with yellow knob and brownish peduncle. Abdomen greenish-black, shining, with delicate whitish hair or almost naked; hypopygium small. hardly half as long as the fifth segment; its rima oblique and to the right of the median line; terminal piece of ovipositor straight and about as long as the hind tibia. Legs black; the apex of the femora and base of tibiæ yellowish; tarsi brownish-yellow, towards the tip black. Wings hyaline; veins black; stigma not colored; fourth costal section hardly twice the third; small cross vein at or apicad the middle of discal cell.

I have only a male before me which agrees with this description. This one is rather old and more or less faded in color, bearing a label marked "Md." The front has a yellowish tinge; antennæ brownish, long white acuminate; abdomen narrowly ovate, as wide as thorax at third and fourth segments, shining, at most grayish tinged only at base; fifth segment longer than fourth, with a large dorsal indentation; sparsely clothed with delicate light colored hairs which are hardly visible. Hypopygium much shorter than fifth (Fig. 104), and about one-half as wide, somewhat assymetrical, but regular in outline, cleft, much more developed beneath, with the intermediate lobe broad. Post-trochanters with tufts of minute hairs on a weak tubercle at bases beneath (Fig. 130). Length, 2.5 mm.; wings (Fig. 175), 2.8 mm.

As to the species *aridus* Williston, and *translatus* Walker, I cannot do better than treat them as synonyms of this species as does Dr. Hough (1899 Hough 78).

43. **P. similis** Hough.

♂. Similar to *subvirescens* Lw. Shining black with greenish tinge. Front and face silvery; lower occiput and faint posterior pleural spots, cinereous. Antennæ black or brown (Fig. 35), more or less sericeous. Abdomen long and narrow (Fig. 108), sides subparallel; fifth segment about one and a half as long as fourth; with two dorsal indentations; clothed with scattered, erect, black, bristle-like hairs, which are also more or less scattered over the other segments, but longest on the lateral margins; lateral comb of first black and small. Hypopygium nearly as long as fifth, assymetrical and cleft, with intermediate and ventral lobes visible from above; the whole organ often so extended as to show the basal membranes. Legs simple, with femoral spines very weak; knees, bases and apices of tibiæ and tarsi, yellow. Wings hyaline (Fig. 171). Length and wings 2.8–3.4 mm.

♀. Similar. Front broader than face, depressed and shining above. Abdomen more ovate and robust; segments 2–5 somewhat constricted at incisures; very sparsely hairy; first slightly hoary; fifth equalling fourth, but sixth slightly longer. Ovipositor slender, extending to base of abdomen (Figs. 109–110), rather abruptly thickened basally, and articulated with the large retracted, subglobose base. Fore and middle femora, and post-trochanters, each with two minute spines at base below, but stronger on fore femora (these are rather difficult to see). Length and wings 2.5–2.8 mm.

Described from Georgia ♂, and Alabama ♀; also reported from New Jersey (1899 Smith 665). Before me is a series from which the above description was based; I am not certain they belong to this species, but they agree more with the typical description than any others I have. They are from: Montreal Island, Quebec (1 ♂, Fig. 108, *coll. Johnson*); Sea Cliff, Long Island (1 ♂, *coll. Banks*); Swarthmore, Pa. (2 ♂s, Figs. 35, 171; 2 ♀s, Figs. 109–110, *Cresson, A. N. S.*).

The long narrow abdomen of the male and the broader transversely constricted abdomen of the females are the most noticeable characters. Of course the females of this group are difficult to separate readily without comparison, and those placed under *scoparius* may belong here. The similarity of habitats were the only causes for placing them as I did.

44. **P. coquilletti** Kertz.

♂. Third joint of antennæ brownish, long silvery acuminate; mesonotum faintly brown pollinose, with yellow humeri and scutellum shining; abdomen at most grayish pollinose laterally; hypopygium

assymetrical, the right side longer than the left, and cleft to right; femora and tibiæ mostly black; wings faintly brownish with fourth costal section three times third and second and third section of fourth vein subequal. Length and wings 3.0 mm.

Described from New York. Type in the Hungarian National Museum. It is unique in having the hypopygium longer on the right side than on the left, but with the cleft on the right. I have not seen it.

45. **P. subnitens** n. sp.

♂. Bare, black, semi-shining species. Front and face silvery. Antennæ with second joint black, and third yellow, long, white acuminate (similar to Fig. 35). Thorax and scutellum gray pollinose, more dense towards the metanotum; humeri whitish-yellow; halteres yellow. Abdomen semi-shining, submetallic, greenish-black, gray pollinose laterally, especially the fourth and fifth segments; first segment with lateral comb of whitish bristles; fifth segment as long as third plus fourth, and narrowed apically; hypopygium nearly symmetrical (Fig. 19) hardly half as long as fifth, cleft to right (Fig. 111). Legs black, simple; knees, bases of tibiæ, and tarsi yellow; flexor series of femoral bristles microscopic or wanting. Wings short, hyaline, without stigma (Fig. 182). Length, 2.8 mm.; wings, 2.5 mm.

♀. Similar, with front wider than face, silvery, but shining black towards vertex. Thorax and scutellum less gray above, and abdomen with slight general hoariness; the straight yellow ovipositor (Fig. 112) extends to apex of third segment, its base globose or very short conical, as long as the ovipositor. Fore femora with two minute basal flexor bristles. Third costal section slightly shorter than fourth, and the fifth about twice that of third plus fourth. Length, 2.8 mm.; wings, 2.3 mm.

Type.—♂. Alamogordo, N. M., May 12, '02 (Figs. 111, 182, *Viereck*, *A. N. S.*, No. 5028.)

Paratype—A female from same locality (Fig. 112).

This species has the legs simple, and the abdomen hardly shining, but dull and of a submetallic luster, not opake or obscured by any tinge of pollen, still in certain aspects it seems more or less faintly hoary. I have also a male from Yosemite Valley, Cala. (*Cresson*, *A. N. S.*), which approaches this species, and is probably distinct. It is more robust (3.3 mm.). The scutellum is more shining; the abdomen has the bristle-like hairs more erect, and the hypopygium is very assymetrical (Figs. 113. 183).

46. **P. scoparius** n. sp.

♂. Similar to *unguiculatus* in general build and color. Front with yellowish tinge. Abdomen narrower, without the cinereous marks ; the bristle-like hairs are more numerous and distinct ; lateral comb of first segment long and black. Hypopygium much smaller than fifth, more symmetrical, but distinctly cleft. Post-trochanters with *tuft of minute bristles or hairs* (Fig. 131) below near base. Wings grayish. Length, 3.3 mm. ; wings, 3.8 mm.

♀. Very similar to those placed under *similis* Hough, but more slender and occiput more swollen ; the abdomen is narrower in proportion, less constricted at incisures, and more thickly hairy ; the ovipositor is shorter, extending only to second segment (Fig. 114). Length, 2.5–2.8 mm. ; wings, 1.9–2.5 mm.

Type.—♂. Eastport, Me., July 15 (Figs. 39, 131, *Johnson, B. S. N. H.*).

Paratypes.—Edgarton, Mass. (1 ♀, Fig. 114, *Johnson, B. S. N. H.*); Beaverkill, N. Y. ; (1 ♀, *Cresson, A. N. S.*); Falls Church, Va. (1 ♂, *coll. Banks*).

This species may be *similis*, but the hypopygium cannot be said to be very assymetrical. I am not at all certain that these females belong here.

47. **P. insularis** n. sp.

♂. Frontal triangle, face and lower occiput silvery,. Antennæ with second joint black, third brownish and long whitish acuminate (Fig. 41). Mesonotum shining, distinctly brown pollinose, lateral margins with minute black bristles ; humeri whitish ; pleuræ and metanotum more opake and gray ; halteres yellow. Abdomen semi-shining, distinctly microscopically transversely rugulose, clothed with minute suberect black bristle-like hair, and microscopically brown pubescent, the pubescence wanting in minute spots at the base of each black hair, sometimes these spots coalescing (this takes very high magnification to detect); first segment with lateral comb of about four long black bristles ; fifth segment slightly longer than fourth. Hypopygium as long as fifth segment, symmetrical in outline, somewhat hemispherical, thickly and evenly whitish pollinose, cleft to right (Fig. 105). Legs simple, black, except the yellow apices of femora, bases of tibiæ, and tarsi ; femora and tibiæ more or less grayish. Wings hyaline (Fig. 169). Length, 3.0 mm. ; wings, 2.7 mm.

♀. Similar with upper half of vertex shining black ; ovipositor (Fig. 106) yellow, as long as its base and extending to apex of third segment ; fore femora with two minute, light colored bristles near base beneath.

Type.—♂. Hamilton Parish, Bermuda Islands, May, 1909 (Figs. 41, 105, 169, *S. Brown, A. N. S.*, No. 5029).

Paratypes.—From the same locality (2 ♂s, 3 ♀s, Fig. 106); Havana, Cuba (1 ♂, *Baker, coll. Johnson*); Bermuda Islands (1 ♀, *Kincaid, coll. Johnson*).

The females cannot be distinguished from those of *appendipes*, except by comparison, when they are seen to be less shining and somewhat cinereous on ventral margins, while that species has no trace of such, at least, the specimens I have seen, which I consider belong there. The males are readily distinguished by the large symmetrical hypopygium.

48. **P. albiseta** n. sp.

♀. Similar to *insularis*, but more robust and less shining. Front very broad, depressed, and *silvery to vertex*. Antennæ brown or black, long acuminate, sericeous. Occiput subopake, much swollen above. Mesonotum and scutellum subopake, brownish tinged; metanotum, especially laterally, cinereous. Abdomen *dull, hardly shining*, except apical segments, which are more or less cinereous laterally in form of large spots; first somewhat hoary, with lateral comb of long *whitish hairs;* black bristle-like hairs rather numerous, especially apically and laterally on fifth. Ovipositor rather slender, thickened at its articulation with the elongo-globose base (Fig. 99); extending to third segment. Legs rather stout; apices of femora, bases of tibiæ and tarsi, yellow; post-tarsi distinctly dilated; fore femora with two long basal hairs beneath; the other legs apparently not adorned; femoral spines not discernable. Wings hyaline. Length, 3.5 mm.; wings, 2.8 mm.

Type.—Hamilton Parish, Bermuda Islands, May, 1909 (Fig. 99, *S. Brown, A. N. S.*, No. 5030).

Paratype.—Belleaire, Fla. (1 ♀, *Slosson, coll. Johnson*).

Distinguished by its robust build, dull, nearly shining abdomen, wide silvery front, and whitish comb on first segment.

49. **P. proximus** n. sp.

♀. Upper part of front shining, lower part, face, and lower occiput silvery. Third antennal joint brownish, long silvery acuminate. Mesonotum semi-opake brown pollinose, in certain aspects whitish anteriorly, with two silvery spots on anterior margin and one in each notopleural depression; a distinct dorso-central series of small bristles which connect anteriorly with a lateral series running obliquely caudad the humeral callus; scutellum subopake. Pleuræ and metanotum somewhat grayish; halteres yellow. Abdomen semi-shining, minutely and weakly rugulose, clothed with short, distinct suberect black hairs, which are very distinct on fifth segment; lateral margins

of apical segment faintly gray pollinose; first segment with lateral comb of four or more black bristles. Ovipositor yellow, straight, twice as long as its conical base and extending to apex of second segment (Fig. 103). Legs black, except yellow knees, extreme bases of tibiæ, and basal joints of tarsi; femora and tibiæ more or less gray or silvery; anterior and middle femora and hind trochanters each with two strong bristles beneath near bases (Fig. 128). Wings hyaline (Fig. 187). Length and wings 3.5 mm.

Type.—Troy, Idaho, V, 31, '08 (*Cresson, A. N. S.*, No. 5027).

This robust species may be recognized by the strong bristles on the femora and hind trochanters beneath.

50. **P. unguiculatus** n. sp.

♂. Similar to those placed under *similis* Hough, but more obscured with brown. Abdomen ovate, broadest at third and fourth segments, minutely granular, giving a subshining appearance, or, slightly metallic lustre, with faint hoary tinge, especially the latter in a lateral spot on fourth and fifth; fifth longer than fourth, much narrowed apically, and broadly indented dorsally, with minute black bristle-like hairs laterally; lateral comb of first distinct and yellow. Hypopygium as long as fifth, assymetrical, cleft, much developed below, with intermediate lobe just visible at sides (Fig. 107). Legs somewhat stouter, darker; post-trochanters with *a curved tooth* near base below (Fig. 132); femoral spines weak. Wings hyaline (Fig. 176). Length and wings 3.2 mm.

One specimen. Falls Church, Va, May (*coll. Banks*).

In the form and appearance of the abdomen this species suggests *subnitens*, but the presence of the trochanteral tooth at once separates it.

51. **P. appendipes** n. sp.

♂. Bare, subshining. Front and face silvery, former with a slight yellow tinge. Antennæ black or brownish, with third joint abruptly acuminate, spiniform apically (Fig. 36). Occiput shining, tinged with brown. Mesonotum and scutellum faintly brownish, the former with minute but distinct dorso-central hairs. Metanotum with lateral cinereous spots. Halteres and humeri yellow. Abdomen shining, greenish-black, destitute of any pollen; first segment with lateral comb of long black hairs; fifth narrowed apically, longer than fourth, but as long ventrally as dorsally. Hypopygium equalling, or, shorter than fifth, faintly pollinose, rather assymetrical, cleft, with intermediate lobe visible at side (Fig. 117). Coxæ, femora except apices, tibiæ except the broad bases and extreme apices, black, otherwise legs yellow; femoral spines minute; post-trochanters each with a

long, curved, subapical process below (Fig. 125), and post-tarsi strongly flattened and dilated, wider than the tibiæ. Wings hyaline (similar to Fig. 168), without colored stigma. Length and wings 2.3–3.2 mm.

♀. Similar. Front depressed and wider than face, narrowed towards antennæ, where only it is silvery. Abdomen shining black. Ovipositor rather abruptly tapering from its globose base, very slender and extending to third segment (Fig. 118). Only extreme apices of femora and bases of tibiæ yellow; tarsi somewhat brownish; post-tarsi dilated; fore and middle femora with two hairs below near bases, but no appendages on posterior legs. Wings short and obtuse, hyaline. Length and wings 3.2–3.5 mm.

Type.—♂. Summerville, S. C., July 2, '06 (Figs. 36, 117, 125, *Cresson, A. N. S.*, No. 5032).

Paratypes.—Manchester, Vt. (1 ♀, *Johnson, B. S. N. H.*); Sea Cliff, Long Island (1 ♂, *coll. Banks*); Falls Church, Va. (1 ♂, *coll. Banks*); Black Mountain, N. C. (1 ♀, Fig. 118, *coll. Banks*). Taken May to September.

These two females do not agree in every respect, but I cannot separate them satisfactorily. The one from Manchester has darker legs which are more cinereous, and tarsi are less dilated than in the other.

52. **P. bidens** n. sp.

♂. Front dark golden; face silvery. Antennæ brownish, acute and spiniform apically (similar to Fig. 36). Mesonotum and scutellum shining greenish-black; humeri and halteres yellow; pleuræ and metanotum very faintly grayish. Abdomen entirely shining or slightly obscured, greenish-black; first segment with lateral series of white bristles; fifth narrowed apically, but not shorter ventrally than dorsally; hypopygium similar to *subvirescens*, assymetrical, shorter than fifth and cleft to right (Fig. 115). Legs black, but knees, bases of tibiæ, and tarsi yellow; femora semi-shining, with flexor series of bristles minute, hind trochanters each with two straight filiform appendages below, one each near base and apex (Fig. 129); hind tarsi only slightly if at all dilated. Wings grayish-hyaline, without stigma (Fig. 168). Length, 2.8 mm.; wings, 2.3–2.5 mm.

Type.—Yosemite Valley, Cala., May 22, '08 (Figs, 115, 129, 168, *Cresson, A. N. S.*, No. 5031).

Paratypes.—Berkeley Hill, Cala., 2; Yosemite Valley, Cala., 1, all by *Cresson, A. N. S.* Taken April and May.

This species is easily distinguished by the two filiform appendages on the hind trochanters.

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sororius n. sp. Ante p. 305.

spurius Fallen = CHALARUS.

subnitens n. sp. Ante p. 316.

subopacus Loew. 1865 Loew 176; 1878 Osten-Sacken 142; 1892 Williston 88; 1899 Hough 79; 1901 Chagnon 13; 1901 Kertesz 164; 1905 Aldrich 344; 1910 Kertesz 381 (*Dorylas*). Ante p. 291.

subvirescens Loew. 1872 Loew 87; 1878 Osten-Sacken 142; 1899 Hough 84; 1899 Smith 665 (*subviridis* Lw.); 1901 Chagnon 13; 1901 Kertesz 164; 1905 Aldrich 344; 1910 Kertesz 382 (*Dorylas*). Ante p. 314.

translatus Walker (? 1899 Hough 78); 1910 Kertesz 382.

aridis Williston (? 1899 Hough 78); 1910 Kertesz 382.

tarsalis Banks, n. sp. Ante p. 309.

translatus Walker. 1857 Walker 150; 1878 Osten-Sacken 142; 1899 Hough 78 (? *subvirescens* Lw.); 1901 Kertesz 165.
unguiculatus n. sp. Ante p. 319.
varius n. sp. Ante p. 309.
velutinus n. var. Ante p. 300.
viduus n. sp. Ante p. 301.
willistonii Kertesz. 1900 Kertesz 244 (nom. nov.); 1901 Kertesz 166; 1905 Aldrich 344; 1910 Kertesz 384 (*Dorylas*). Ante p. 313.
aculeatus Williston (nec. Loew). 1892 Williston 88; 1896 Williston 351, Pl. XI, Fig. 87.
xanthopodus Williston. 1892 Williston 87; 1901 Kertesz 166; 1905 Aldrich 344; 1910 Kertesz 384 (*Dorylas*). Ante p. 312.

EXPLANATION OF PLATES.

All the figures given were drawn by the aid of the camera lucida, and are merely outlines showing general form of the antennæ, genitalia, wings, etc. As much depends upon the angle in which objects are viewed, this must be taken into account when referring to these figures, especially of the genitalia. Also in many cases of the wing drawings, the apparent fold between the third and fourth veins, makes the anterior cross-vein appear shorter in proportion. On each plate is a scale representing about one millimeter, which will be a guide for ascertaining the relative lengths of the objects.

Plate V. Antennæ.

FIGURE

1. Chalarus spurius ♂.
2. Verrallia pilosa ♂.
3. Pipunculus nigripes ♀.
4. " " ♂.
5. " fuscitarsis ♂.
6. " mainensis ♂.
7. " " ♀.
8. " viduus ♂.
9. " tarsalis ♂.
10. " femoratus ♂.
11. " atlanticus ♂.
12. " æquus ♂.
13. " subopacus ♀.
14. " alpinus ♂.
15. " caudatus ♂
16. " sororius ♀.
17. " cingulatus ♂.
18. " alternatus ♂.
19. " varius ♂.
20. " luteicornis ♀.
21. " horvathi ♀.

FIGURE

22. Pipunculus flavomaculatus ♀.
23. " " ♂.
24. " houghi ♀.
25. " " ♂.
26. " acuminatus ♀.
27. " discolor ♂.
28. " minor ♂.
29. " " ♀.
30. " dubius ♂.
31. " " ♀.
32. " constrictus ♂.
33. " fuscus ♂.
34. " confraternus ♂.
35. " similis ♂.
36. " appendipes ♂.
37. " brevis ♀.
38. " atramontensis ♂.
39. " scoparius ♂.
40. " unguiculatus ♂.
41. " insularius ♂.
42. " albofasciatus ♂.

Plate VI. Genitalia.

FIGURE

43. Chalarus spurius.
44. Verrallia pilosa.
45. " "
46. " "
47. Pipunculus semifasciatus.
48. " "

FIGURE

49. Pipunculus atlanticus.
50. " "
51. " "
52. " discolor.
53. " nigripes.
54. " "

FIGURE
55. Pipunculus nigripes.
56. " appendiculatus.
57. " fuscitarsis.
58. " dubius.
59. " "
60. " caudatus.
61. " "
62. " subopacus.
63. " varius.
64. " æquus.
65. " "
66. " "
67. " cingulatus.
68. " "
69. " cingulatus var. velutinus.
70. " cingulatus var. velutinus.
71. " cingulatus var. velutinus.
72. confraternus.
73. "

FIGURE
74. Pipunculus confraternus
75. " fuscus.
76. " constrictus.
77. " acuminatus.
78. " horvathi.
79. " brevis.
80. " affinis.
81. " "
82. " houghi.
83. " "
84. " viduus.
85. " "
86. " alpinus.
87. " sororius.
88. " "
89. " mainensis.
90. " minor.
91. " "
92. " femoratus.
93. " "
94. " angus.
95. " "

Plate VII. Genitalia, etc.

FIGURE
96. Pipunculus albofasciatus.
97. " "
98. " "
99. " albiseta.
100. " flavomaculatus.
101. " "
102. " "
103. " proximus.
104. " subvirescens.
105. " insularis.
106. " "
107. " unguiculatus.

FIGURE
108. Pipunculus similis.
109. " "
110. " "
111. " subnitens.
112. " "
113. " "
114. " scoparius.
115. " bidens.
116. " luteicornis.
117. " appendipes.
118. " "
119. " atramontensis.

FIGURE
120. Verrallia pilosa ♀, fore-femur.
121. Pipunculus femoratus ♂, post-femur.
122. " luteicornis ♀, post-femur.
123. " nigripes ? ♂, post-tibia.
124. " appendiculatus ♀, head.

125. Pipunculus appendipes ♂, posterior leg.
126. " mainensis ♂, post-femur.
127. " atramontensis ♂, post-femur.
128. " proximus ♀, post-trochanter.
129. " bidens ♂, post-trochanter.
130. " subvirescens ♂, post-trochanter.
131. " scoparius ♂, post-trochanter.
132. " unguiculatus ♂, post-trochanter.

Plate VIII. Wings.

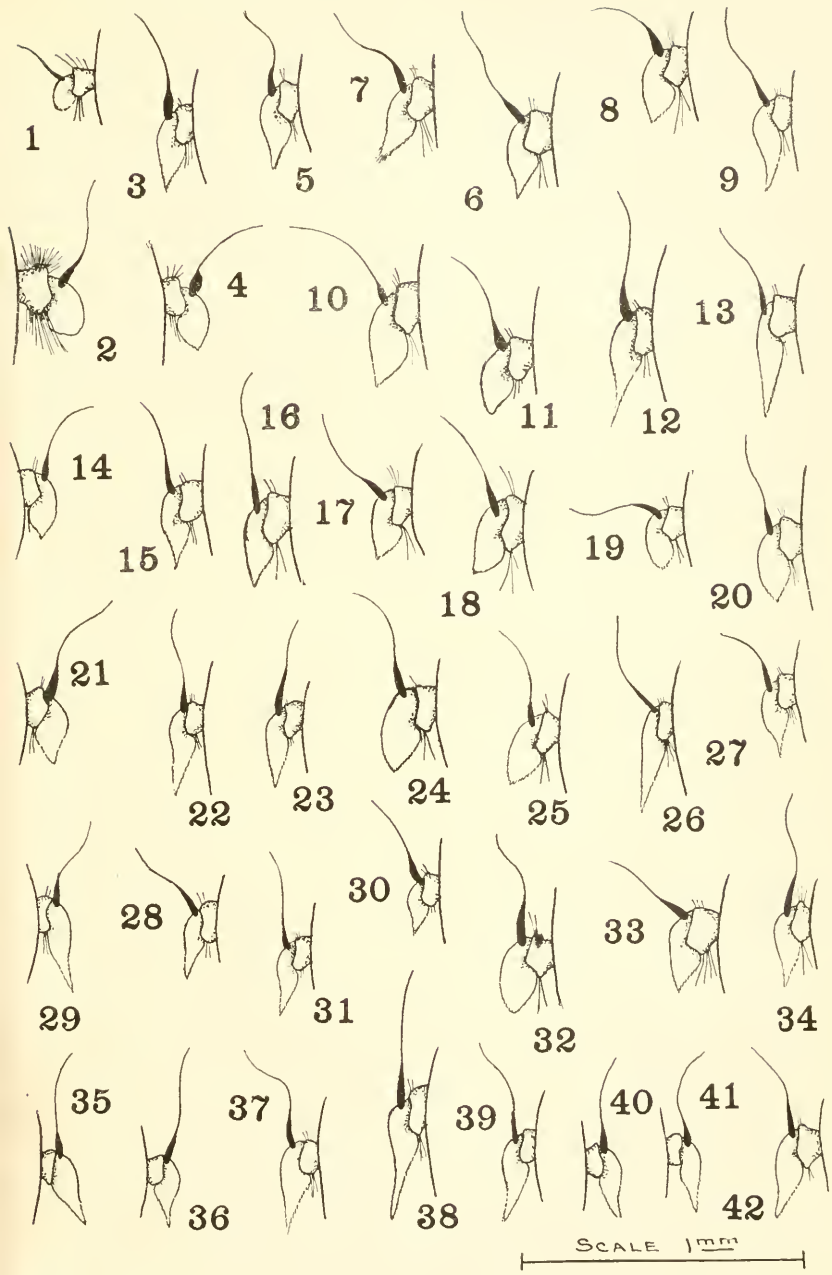
FIGURE
133. Pipunculus atlanticus ♂.
134. " " ♀.
135. " " ♂.
136. " " ♂.
137. " brevis ♀.
138. " dubius ♂.
139. " confraternus ♂.
140. " caudatus ♂.
141. " fuscitarsis ♂.
142. " viduus ♂.
143. " " ♂.
144. " subopacus ♂.
145. " " ♀.
146. " sororius ♀.
147. " " ♀.

FIGURE
148. Pipunculus varius ♂.
149. " " ♂.
150. " mainensis ♂.
151. " " ♀.
152. Chalarus spurius ♂.
153. Pipunculus minor ♂.
154. " " ♂.
155. " acuminatus ♀.
156. " fuscus ♂.
157. " femoratus ♂.
158. " appendiculatus ♂.
159. " appendiculatus ♀.

Plate IX. Wings.

FIGURE
160. Pipunculus alternatus ♂.
161. " cingulatus var. velutinus ♂.
162. " horvathi ♀.
163. Verralia pilosa ♂.
164. " " ♀.
165. Pipunculus tarsalis ♂.
166. " affinis ♂.
167. " nigripes ♀.
168. " bidens ♂.
169. " insularis ♂.
170. " alpinus ♀.
171. " similis ♂.
172. " angus ♀.
173. " luteicornis ♀.
174. " cingulatus ♂.

FIGURE
175. Pipunculus subvirescens ♂.
176. " unguiculatus ♂.
177. " discolor ♂.
178. " constrictus ♂.
179. " houghi ♂.
180. " æquus ♂.
181. " semi-fasciatus ♂.
182. " subnitens ♂.
183. " " var. ♂.
184. " flavomaculatus ♂.
185. " " ♀.
186. " " ♀.
187. " proximus ♀.
188. " albofasciatus ♂.
189. " " ♀.
190. " atramontensis ♂.



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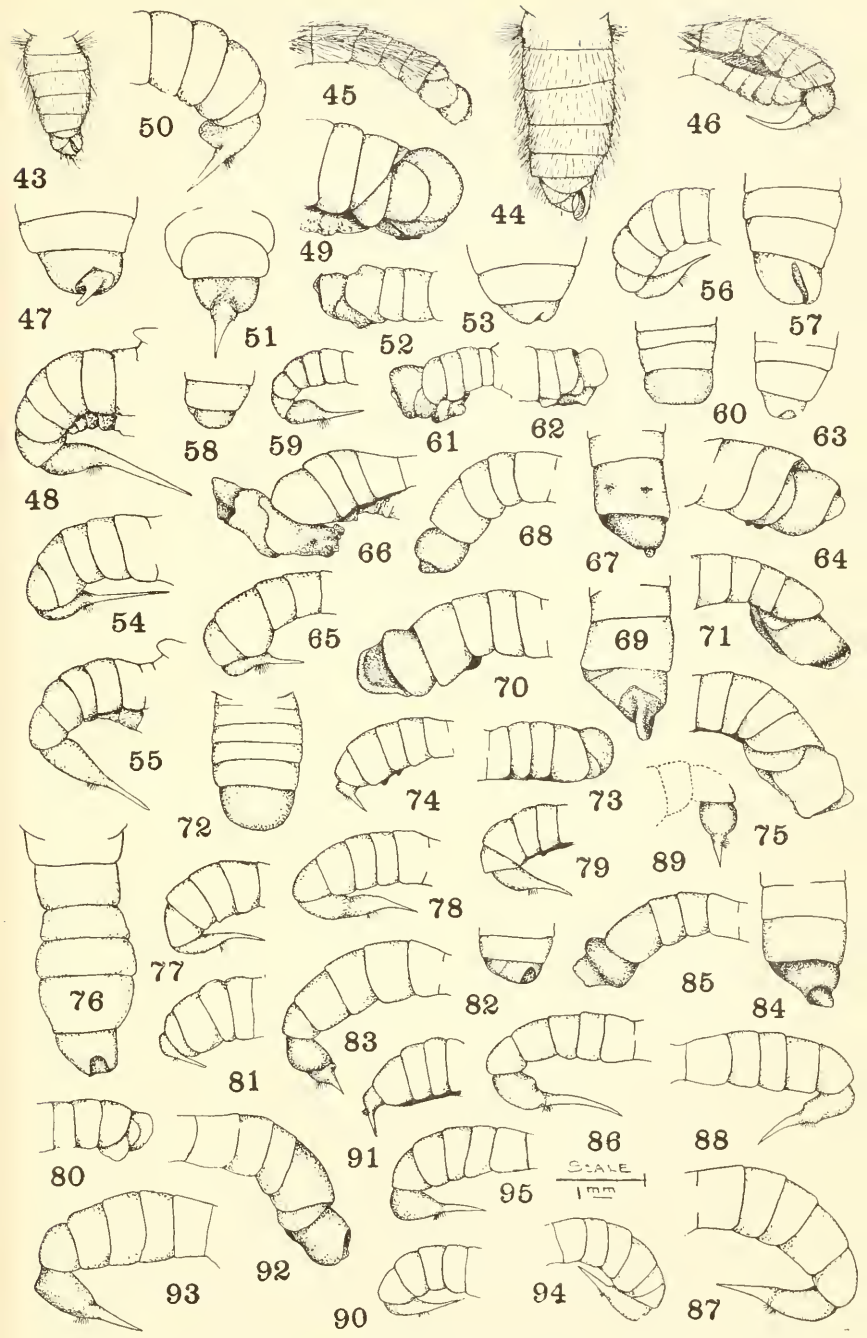

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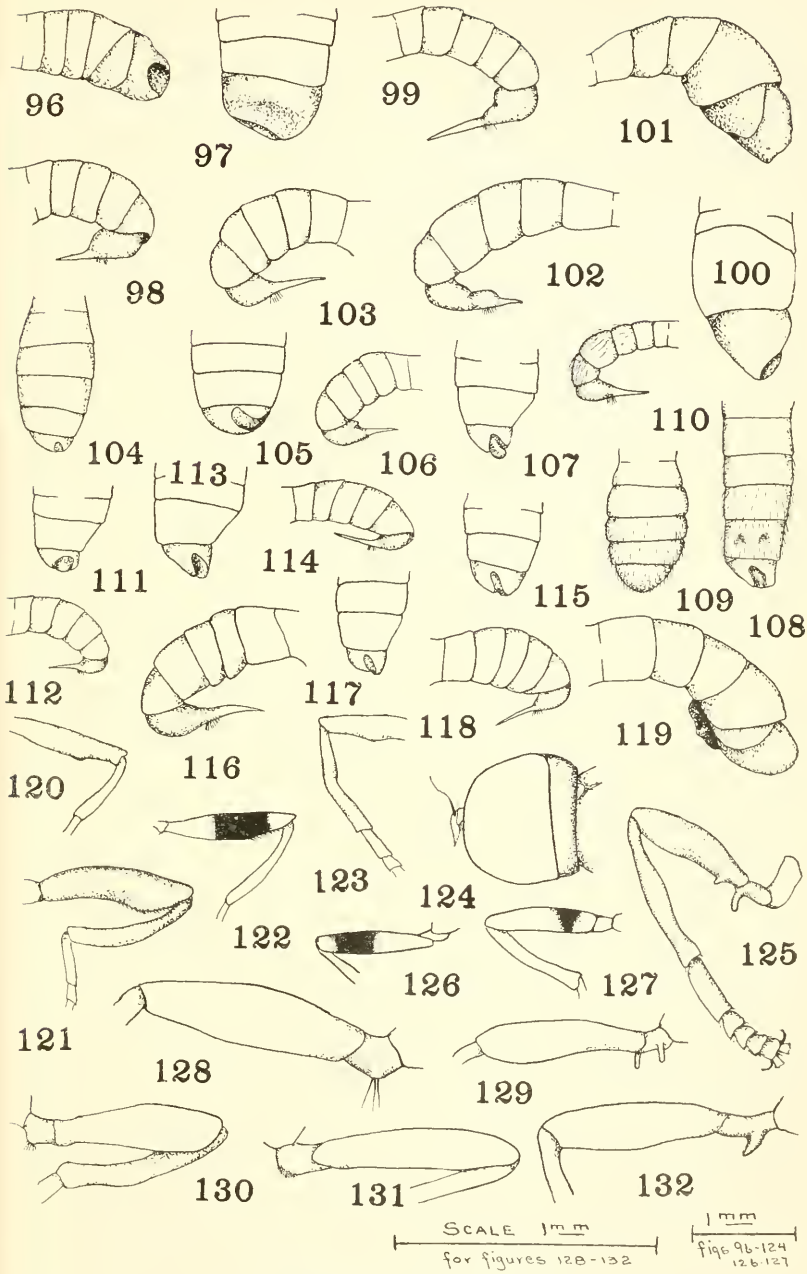

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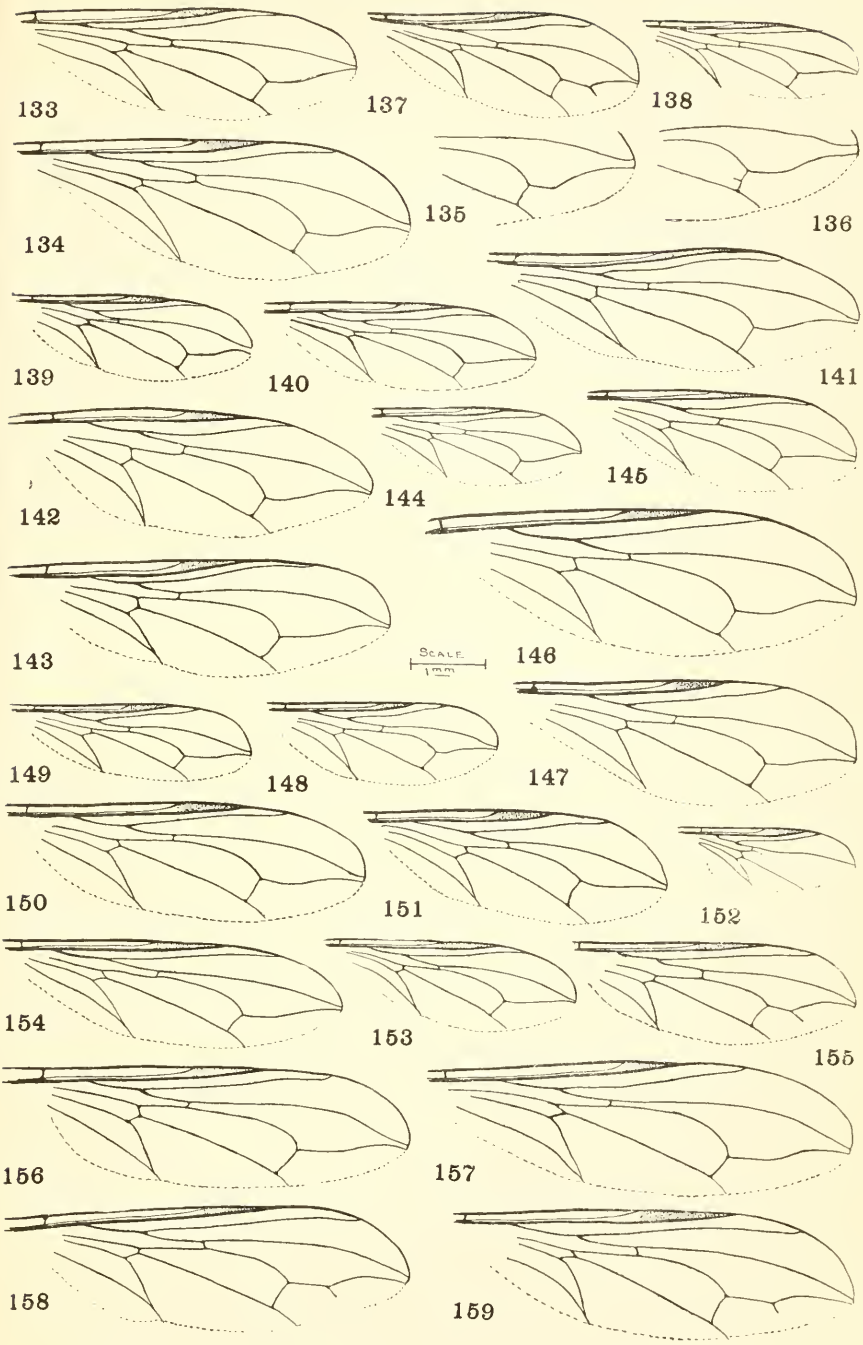

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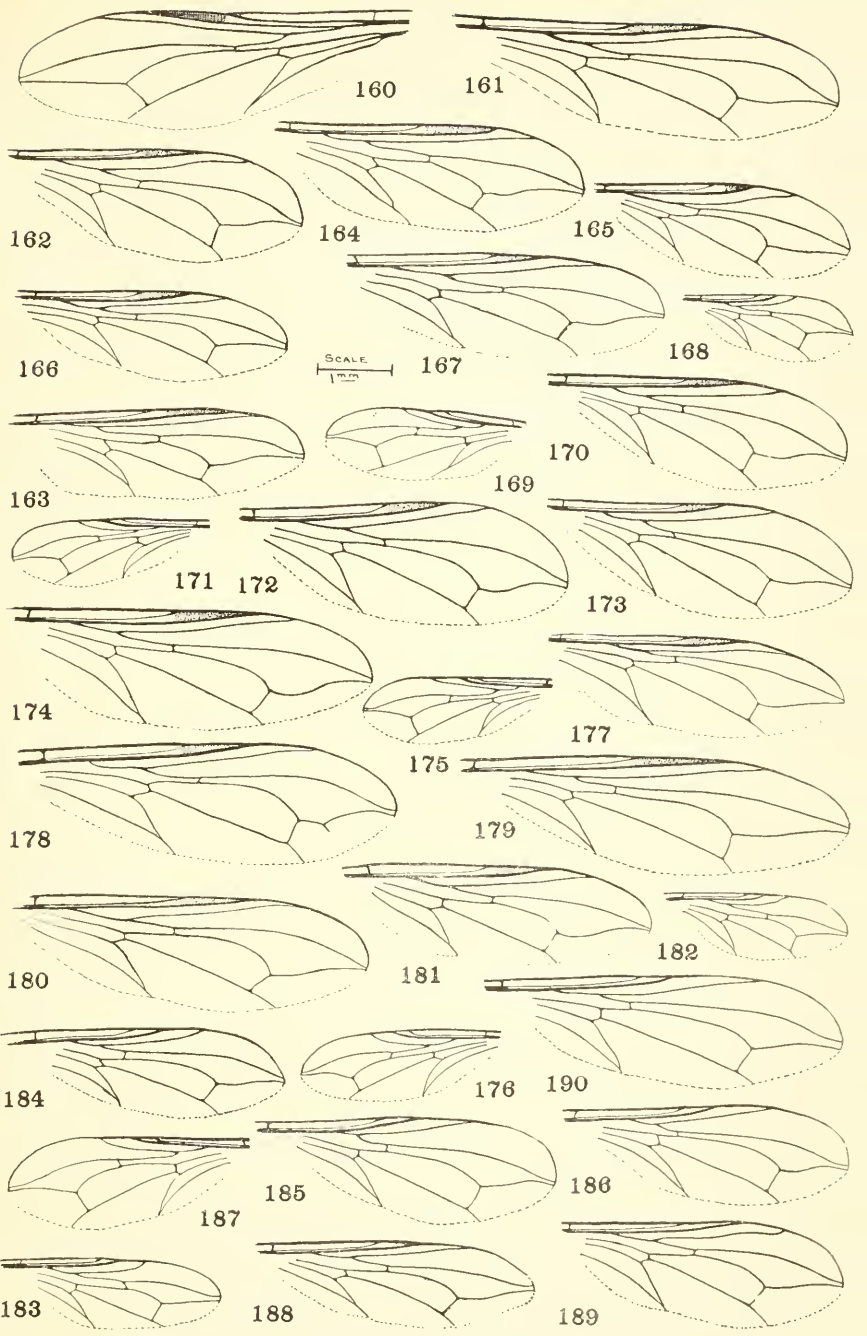

CRESSON ON PIPUNCULIDÆ.

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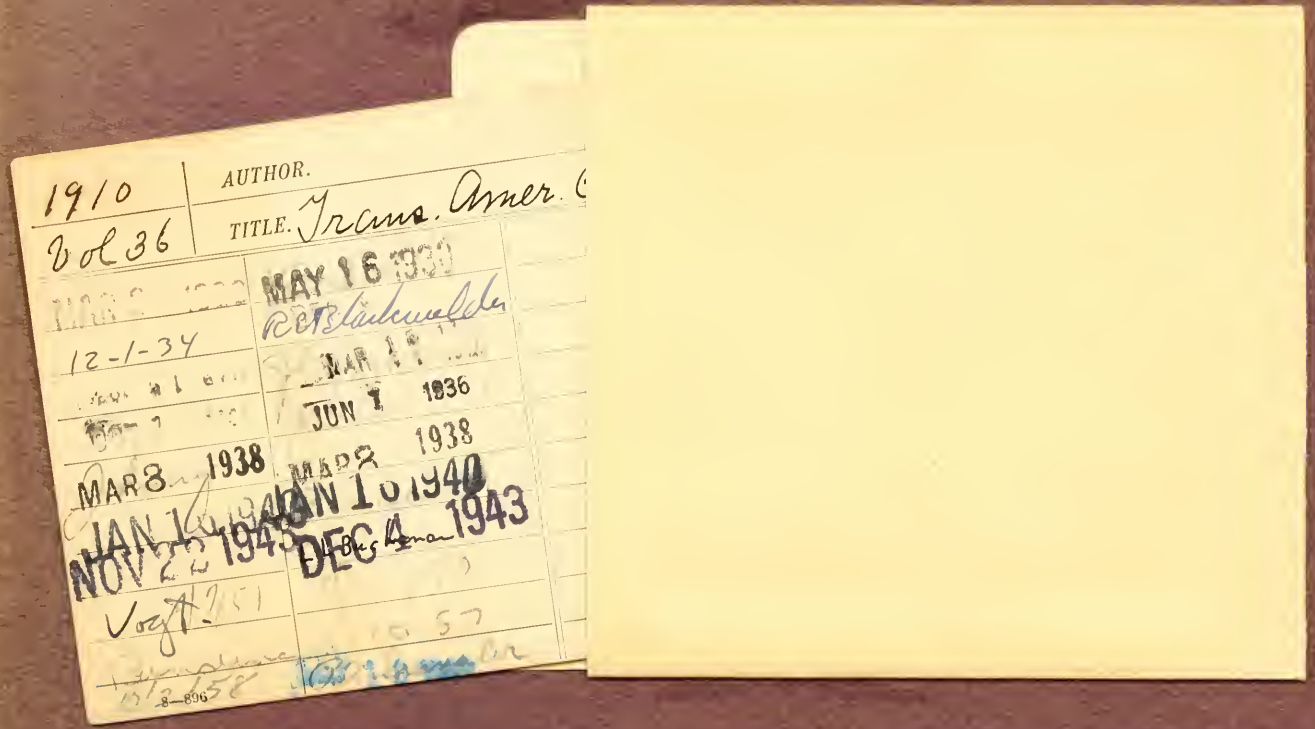

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